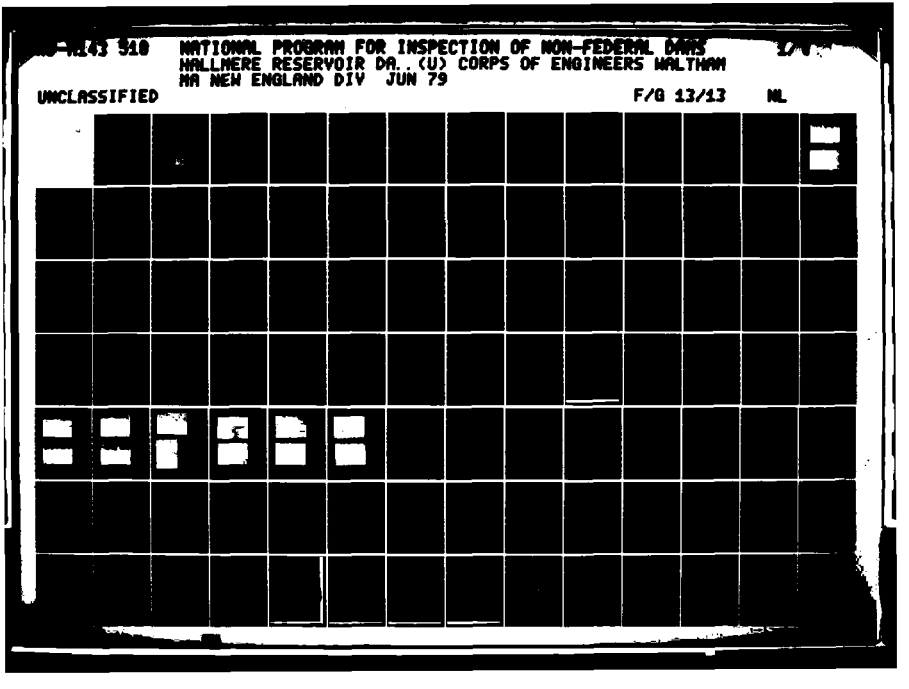
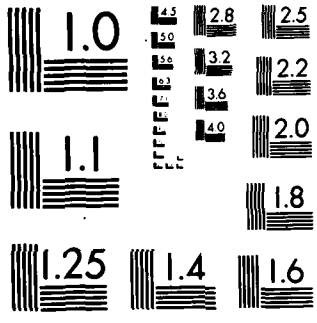

NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS
HALLMERE RESERVOIR DA..(U) CORPS OF ENGINEERS WALTHAM
MA NEW ENGLAND DIV JUN 79
UNCLASSIFIED
F/G 13/13
NL



CONNECTICUT RIVER BASIN
BERLIN, CONNECTICUT

HALLMERE RESERVOIR DAM

CT 00249

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS. 02154

JUNE 1979

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER CT 00249	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Hallmere Reservoir Dam NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS		5. TYPE OF REPORT & PERIOD COVERED INSPECTION REPORT 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) U.S. ARMY CORPS OF ENGINEERS NEW ENGLAND DIVISION		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS DEPT. OF THE ARMY, CORPS OF ENGINEERS NEW ENGLAND DIVISION, NEDED 424 TRAPELO ROAD, WALTHAM, MA. 02254		12. REPORT DATE June 1979 13. NUMBER OF PAGES 45
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

APPROVAL FOR PUBLIC RELEASE: DISTRIBUTION UNLIMITED

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

Cover program reads: Phase I Inspection Report, National Dam Inspection Program; however, the official title of the program is: National Program for Inspection of Non-Federal Dams; use cover date for date of report.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

DAMS, INSPECTION, DAM SAFETY,

Conn. River Basin
Berlin, Conn.

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Hallmere Reservoir Dam is an earthfill embankment about 570 ft. long and 45 ft. high. It has a concrete core and a riprap covered upstream face. The dam appears to be in fair condition. Seepage was noted at the downstream toe of the dam. The test flood inflow is 3,200 cfs. The routed test flood outflow (2,900 cfs) overtops the dam by 0.7 ft.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

REPLY TO
ATTENTION OF:
NEDED

SEP 17 1979

Honorable Ella T. Grasso
Governor of the State of Connecticut
State Capitol
Hartford, Connecticut 06115

Dear Governor Grasso:

I am forwarding to you a copy of the Hallmere Reservoir Dam Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. This report is presented for your use and is based upon a visual inspection, a review of the past performance and a brief hydrological study of the dam. A brief assessment is included at the beginning of the report. I have approved the report and support the findings and recommendations described in Section 7 and ask that you keep me informed of the actions taken to implement them. This follow-up action is a vitally important part of this program.

A copy of this report has been forwarded to the Department of Environmental Protection, the cooperating agency for the State of Connecticut. In addition, a copy of the report has also been furnished the owner, Town of Meriden, Meriden, Connecticut 06450.

Copies of this report will be made available to the public, upon request, by this office under the Freedom of Information Act. In the case of this report the release date will be thirty days from the date of this letter.

I wish to take this opportunity to thank you and the Department of Environmental Protection for your cooperation in carrying out this program.

Sincerely yours,

MAX B. SCHEIDER
Colonel, Corps of Engineers
Division Engineer

Incl
As stated

HALLMERE RESERVOIR DAM

CT 00249

CONNECTICUT RIVER BASIN
BERLIN, CONNECTICUT

PHASE I INSPECTION REPORT
NATIONAL DAM INSPECTION PROGRAM

NATIONAL DAM INSPECTION PROGRAM
PHASE I INSPECTION REPORT

Identification No.:	CT 00249
Name of Dam:	Hallmere Reservoir Dam
Town:	Berlin
County and State:	Hartford County, Connecticut
Stream:	John Hall Brook
Dates of Inspection:	24 April and 9 May 1979

BRIEF ASSESSMENT

Hallmere Reservoir Dam is an earthfill embankment about 570 ft. long and 45 ft. high. It has a concrete core and a riprap covered upstream face. It was constructed in 1896-97 for purposes of water supply. A 30 ft. wide masonry wasteway with a sill and flashboards serves as the spillway. The only regulated outlet is a 20 in. dia. concrete pipe.

The maximum storage capacity of the reservoir to top of dam is about 585 acre-ft. and the drainage area is about 1 sq. mi. The reservoir is about 2,250 ft. long with a surface area of 18.4 acres at spillway crest elevation. Based on height, the dam is classified as intermediate in size. Because a breach of the dam might affect at least 11 homes, with the possibility of loss of more than a few lives and extensive economic loss, as well as two local roads and a major gas pipe line, the dam has been classified as having a high hazard potential. Based on intermediate size and high hazard, the selected test flood is a full PMF.

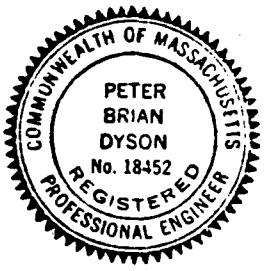
The dam appears to be in fair condition. Brush and tree growth has begun to intrude on the slopes and crest of the embankment. Seepage was noted at the downstream toe of the dam. Animal burrows and missing riprap were apparent on the upstream slope of the embankment.

The test flood inflow is 3,200 cfs. The routed test flood outflow (2,900 cfs) overtops the dam by 0.7 ft. The spillway is adequate to pass an outflow corresponding to about 51 percent of the routed test flood outflow, but the spillway and discharge channel walls would be overtopped by about 5 ft.

Within one year after receipt of this Phase I Inspection Report, the owner, the City of Meriden, should retain the services of a registered professional engineer to make further hydrologic and geotechnical investigations, and should implement his recommendations regarding: (1) whether modifications of the spillway are required to improve the ability of the facility to handle higher flows; (2) possible elimination of use of flashboards, or modifications to facilitate their quick removal; (3) whether spillway and discharge channel modifications are required to forestall overtopping of the walls; and (4) the cause of seepage at the toe of the embankment.

The owner should implement the following maintenance measures: (1) remove brush and trees from the embankment; (2) restore riprap, backfill voids on the upstream face of the embankment, and control burrowing rodents; (3) clear spillway of growth and debris; (4) repair floor of the masonry wasteway; (5) reconstruct or remove the bridge over the spillway; (6) consider reconstruction of the access bridge to the control tower in order to facilitate the operations during periods of heavy rainfall; (7) develop a formal surveillance and flood warning system; and (8) institute procedures for an annual periodic technical inspection.

Peter B. Dyson
Project Manager



This Phase I Inspection Report on Hallmere Reservoir Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.

JOSEPH W. FINEGAN, JR., MEMBER
Water Control Branch
Engineering Division

JOSEPH A. MCELROY, MEMBER
Foundation & Materials Branch
Engineering Division

CARNEY M. TERZIAN, CHAIRMAN
Chief, Structural Section
Design Branch
Engineering Division

APPROVAL RECOMMENDED:

JOE B. FRYAR
Chief, Engineering Division

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation: however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

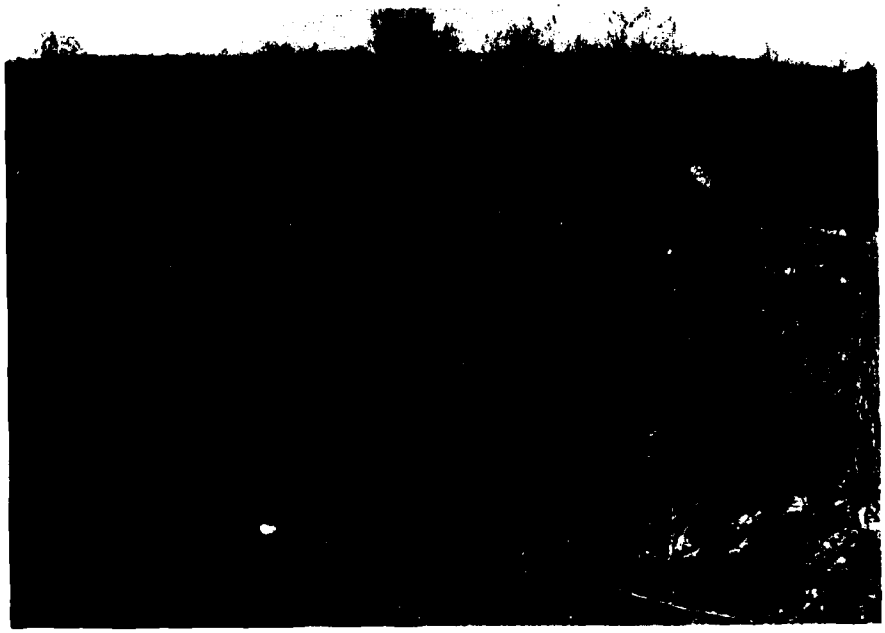
It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

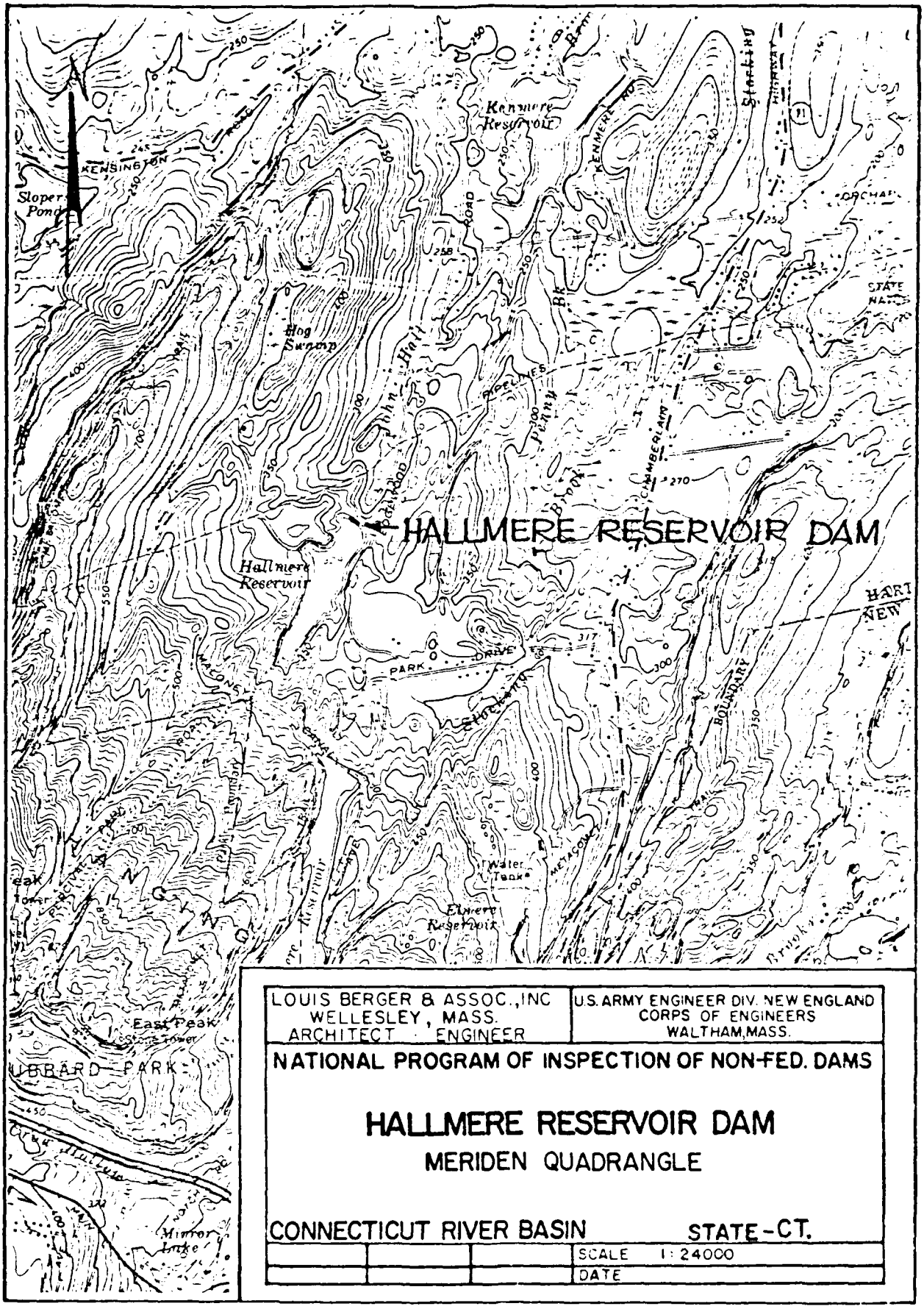
TABLE OF CONTENTS

HALLMERE RESERVOIR DAM

Overview from Left Abutment



Overview from Right Abutment



LOUIS BERGER & ASSOC., INC WELLESLEY, MASS. ARCHITECT ENGINEER	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

HALLMERE RESERVOIR DAM

MERIDEN QUADRANGLE

CONNECTICUT RIVER BASIN STATE-CT.

			SCALE 1:24000
			DATE

PHASE I INSPECTION REPORT

HALLMERE RESERVOIR DAM CT 00249

SECTION 1 - PROJECT INFORMATION

1.1 General

a. Authority. Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a national program of dam inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the New England Region. Louis Berger & Associates, Inc. has been retained by the New England Division to inspect and report on selected dams in the State of Connecticut. Authorization and notice to proceed was issued to Louis Berger & Associates, Inc. under a letter of 19 March 1979 from John P. Chandler, Colonel, Corps of Engineers. Contract No. DACW33-79-C-0051 has been assigned by the Corps of Engineers for this work.

b. Purpose.

(1) Perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.

(2) Encourage and assist the States to initiate quickly effective dam safety programs for non-Federal dams.

(3) Update, verify and complete the National Inventory of Dams.

1.2 Description of Project

a. Location. Hallmere Reservoir Dam is located in the Town of Berlin, Hartford County, Connecticut. The dam is about 3 miles northwest of Meriden, Connecticut and can be reached via Reservoir Ave. and Edgewood Road. The dam is situated at the headwaters of John Hall Brook, which flows from Hallmere Reservoir to Kenmere Reservoir. About 1 mile below Kenmere Reservoir the brook joins Stocking Brook, a tributary of the Mattabesset River. The dam is shown on U.S.G.S., Quadrangle, Meriden, Connecticut, with coordinates approximately at N41°34'39", W72°48'58".

b. Description of Dam and Appurtenances

(1) Description of Dam. Hallmere Reservoir Dam is a 45 ft. high and 570 ft. long earthfill dam with a crest width of 16 ft., and 2 horizontal to 1 vertical upstream and downstream slopes. The embankment has a concrete core wall extending upward from variable depths to within 2 ft. of the top of the embankment.

The concrete core extends laterally into original ground on the left aubtment and under the masonry wasteway located on the right abutment. A clay core extends out about 350 ft. beyond the end of the concrete core in the left abutment area. The upstream face of the dam is covered with riprap of rather small dimension which is loosely placed.

(2) Spillway. The spillway for Hallmere Reservoir Dam is located at the right abutment of the dam. It is a 30 ft. wide masonry wasteway with a sill on which are permanently installed 1.8 ft. high wooden flashboards. Beyond the flashboards the discharge channel is bounded by about 2.5 ft. high masonry training walls, and it slopes at a grade of about 5 to 6 percent for a distance of about 400 ft. before discharging into John Hall Brook. A steel truss bridge spans the wide flat sill of the wasteway. The superstructure of this bridge, which provides access to the dam crest from Reservoir Avenue, has deteriorated and the timber deck has been partially removed.

(3) Outlets. The single regulated outlet for the dam is at its mid-span, where a 15 ft. x 15 ft. wet well and gate house are located at the upstream toe about 95 ft. from the crest of the dam. The outlet conduit is a 20 in. dia. concrete pipe which extends about 210 ft. from the wet well to the lowest point on the downstream toe of the dam. A masonry headwall and a concrete apron about 35 ft. long are located at the outlet end. A bridge originally provided access to the gate house, but it has been removed because of vandalism. Water Department personnel now use a boat for gaining access to the gatehouse, where a 20 in. manual gate valve regulates flows through the outlet pipe.

c. Size Classification. The Hallmere Reservoir Dam is about 45 ft. high, impounding a storage of 440 acre-ft. to spillway crest level and about 585 acre-ft. to top of dam. In accordance with size and capacity criteria promulgated in the Recommended Guidelines for Safety Inspection of Dams, the project is categorized in the intermediate classification.

d. Hazard Classification. A breach failure of the dam at Hallmere Reservoir would release water down John Hall Brook to Kenmere Reservoir. Between the two reservoirs, John Hall Brook closely parallels Edgewood Road, crossing it at three different locations. The brook passes through a pipe culvert under Orchard Road before entering Kenmere Reservoir. A major gas pipeline also crosses the brook about 1,000 ft. below the dam. Should a breach of the dam occur, 11 homes are located sufficiently close to the stream to sustain damage. Estimated flood depths range from 21 ft. at a point 1,500 ft. downstream of the dam, to about 11 ft. at a point just above Kenmere Reservoir. It is highly probable that a breach of Hallmere Reservoir Dam would result in an overtopping of the dam at Kenmere Reservoir.

A sudden breach of the dam could cause the loss of more than a few lives and extensive damage to houses, secondary roads and an important public utility. Consequently, Hallmere Reservoir Dam has been classified as having a high hazard potential, in accordance with the Recommended Guidelines for Safety Inspection of Dams.

e. Ownership. Hallmere Reservoir Dam is owned by the City of Meriden, Connecticut.

f. Operator. Mr. Bruce Soroka, City Engineer, City of Meriden, Main Street, Meriden, Connecticut 06450. Tel: (203) 634-0003.

g. Purpose of Dam. Hallmere Reservoir Dam is operated in conjunction with other water storage facilities, for providing municipal water supplies to the City of Meriden.

h. Design and Construction History. Plans of the dam were obtained from the City of Meriden and copies are exhibited in Appendix B. The original bridge which extended from the earth embankment to the gate house has been removed. The designer and builder of the dam are unknown, but records show it as having been constructed in 1896-97.

j. Normal Operating Procedure. There are no written operating procedures for the dam. Permanent flashboards are installed on the spillway to increase storage capacity of the reservoir. A staff gauge is attached to the outside of the wet well for indicating the level of the reservoir. The gate house is only accessible by boat. City personnel indicated that the reservoir is usually drawn down to a nearly dry state at some time during the summer months. Outlet gate operation at the reservoir is not a day-to-day procedure.

1.3 Pertinent Data

a. Drainage Area. The drainage area contributing to Hallmere Reservoir is situated at the headwaters of John Hall Brook. The drainage area encompasses a total of about 1.02 sq. mi. (650 acres) of which about 18.4 acres are occupied by the reservoir. It should be noted that the natural drainage area for the reservoir is larger than 1.02 sq. mi. but a portion of the runoff from the natural drainage area has been diverted by the Maloney Canal to Merimere Reservoir, located about 1,500 ft. south of Hallmere Reservoir. The longest circuitous stream course contributing to the reservoir is about 9,200 ft. long with an elevation difference of about 581 ft., or at a slope of about 334 ft./mile. The drainage area has a length of about 2 mi. and a maximum width of about 4.5 mi. The basin is entirely forested and undeveloped, and can best be described as rolling to mountainous terrain.

b. Discharge at Damsite

(1) Outlet Works Conduit. Discharges from Hallmere Reservoir are provided by a 210 ft. long 20 in. dia. concrete pipe through the mid point of the dam. The capacity of the outlet pipe is about 52 cfs when the water surface is at the top of dam and slightly higher when at test flood elevation.

(2) Maximum Known Flood at Damsite. No records are available of flood inflows into Hallmere Reservoir, nor of spillway releases and surcharge heads during such inflows.

(3) Ungated Spillway Capacity at Top of Dam. The spillway at the reservoir is an ungated masonry wasteway with permanent flashboards installed. The spillway capacity at top of dam, elevation 334.0 MSL, is 1,470 cfs. Without the flashboards, the spillway capacity at top of dam is 1,755 cfs.

(4) Ungated Spillway Capacity at Test Flood Elevation. The ungated spillway capacity is about 1,850 cfs at test flood elevation 334.7 MSL. If no flashboards were installed the ungated spillway capacity would be about 2,070 cfs at the test flood elevation.

(5) Gated Spillway Capacity at Normal Pool Elevation. Not applicable.

(6) Gated Spillway Capacity at Test Flood Elevation. Not applicable.

(7) Total Spillway Capacity at Test Flood Elevation. The total spillway capacity at the test flood elevation is the same as (4) above, 1,850 cfs at elevation 334.7 MSL. Without the flashboards, the total spillway capacity would be the same as stated in (4) above, 2,707 cfs.

(8) Total Project Discharge at Test Flood Elevation. The spillway is inadequate to handle the test flood and the dam would be overtopped by about 0.7 ft. The total discharge through the spillway and over the dam at elevation 334.7 MSL would be about 2,900 cfs.

c. Elevations (Ft. above MSL)

(1) Streambed at centerline of dam - 285.0

(2) Maximum tailwater - Not available

(3) Upstream invert of outlet culvert - 289.5±

(4) Recreation Pool - Not applicable

(5) Full flood control pool - Not applicable

(6) Ungated spillway crest - 329.0 (top of flashboards)
327.2 (without flashboards)

(7) Design surcharge (original design) - Unknown

(8) Top of dam - 334.0

(9) Test flood design surcharge - 334.7

d. Reservoir

(1) Length of maximum pool - 2,250 ft.

(2) Length of recreation pool - Not applicable

(3) Length of flood control pool - Not applicable

e. Storage (acre-ft.)

(1) Recreation pool - Not applicable

(2) Flood control pool - Not applicable

(3) Spillway crest pool El. 329.0 - 440

(4) Top of dam El. 334.0 - 585

(5) Test flood pool El. 324.7 - 608

f. Reservoir Surface (acres)

(1) Recreation pool - Not applicable

(2) Flood control pool - Not applicable

(3) Spillway crest El. 329.0 - 18.4

(4) Top of dam El. 334.0 - 23.0

(5) Test flood pool El. 334.7 - 23.6

g. Dam

(1) Type - Earthfill with concrete core

(2) Length - 570 ft.

(3) Height - 45 ft.

(4) Top width - 16 ft.

(5) Side slopes - Upstream 2 horizontal to 1 vertical
Downstream 2 horizontal to 1 vertical

(6) Zoning - Unknown

(7) Impervious core - Concrete

(8) Cutoff - Unknown

(9) Grout curtain - None

h. Diversion and Regulating Tunnel - None

i. Spillway

(1) Type - Masonry wasteway sill with permanent 1.8 ft. high wooden flashboards

(2) Length of weir - 30 ft.

(3) Crest elevation - 329.0 (top of flashboards)
327.2 (without flashboards)

(4) Gates - None

(5) Upstream channel - Masonry training walls with pavers.

(6) Downstream channel - Masonry training walls about 2.5 ft. high along spillway discharge channel - entire bottom lined with pavers.

j. Regulating Outlets

(1) Invert - 289.5 Ft. ±

(2) Size - 20 inch diameter

(3) Description - Concrete Pipe

(4) Control Mechanism - 20 in. gate valve in gate house with control hoist

SECTION 2 - ENGINEERING DATA

2.1 Design Data

Plans including profiles and sections of the proposed and completed dam are exhibited in Appendix B. The designer of the dam is unknown and no engineering design data for the dam has been located.

2.2 Construction Data

Plans showing "as built" drawings of the dam are exhibited in Appendix B. The builder of the dam is unknown and no correspondence or construction data for the dam has been located. It is recorded that construction of the dam started on June 18, 1896 and that work was completed on November 17, 1897.

2.3 Operation Data

The dam is operated by the City of Meriden, Connecticut. There appear to be no formal operating records.

2.4 Evaluation of Data

a. Availability. Since little engineering data is available, it is not possible to make an assessment of the safety of the embankment. The basis of the information presented in this report is principally the visual observations of the inspection team.

b. Adequacy. The lack of in-depth engineering data did not allow for a definitive review. Therefore, the adequacy of this dam could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on visual inspection, past performance history and sound engineering judgment.

c. Validity. Not applicable.

SECTION 3 - VISUAL INSPECTION

3.1 Findings

a. General. The visual inspection of Hallmere Reservoir and Dam took place on 24 April and 9 May 1979. The reservoir was at about elevation 329 MSL. The flow over the spillway flashboards was estimated to be about 2.5 cfs. The dam appeared to be in generally fair condition.

b. Dam. Hallmere Reservoir Dam is an embankment about 540 ft. long with a maximum height of 45 ft. and a crest width of 16 ft. The horizontal and vertical alignment of the embankment was good. The riprap on the upstream face of the dam was rather small, the maximum size being about 1 ft. There was an extensive intrusion of light growth through the loosely placed riprap. There were several large holes in the right half of the embankment on the upstream side that appeared to have been caused by burrowing animals.

In the center of the dam, opposite the gatehouse, there appeared to be an unusual amount of voids in the upstream riprap that did not appear to be attributable entirely to the loss of fines. Remnants of the foundations for the gatehouse access bridge were present in the upstream face, together with one large stump about 3 ft. dia., and much small brush. (See Photo. No. 1 & No. 2, Appendix C).

To the west of the bridge foundations riprap could not be seen above the water line for about 100 ft., but then it periodically reappeared through the heavy brush. There was evidence of frequent trespass across the crest of the dam, despite the deteriorated condition of the access bridge over the spillway. The water at the time of inspection seemed to be somewhat higher than might be considered as normal, since many growing trees were submerged in the reservoir, apparently to depths of as much as 3 to 4 ft.

The terrain on the downstream side of the left abutment is irregular and undulating, possibly indicative of shallow rock. Much underbrush, some of it dead, was evident on the downstream face, including a recently uprooted pine tree. Several mature trees have taken stand on the downstream face. (See Photo No's. 3 and 4, Appendix C).

At the downstream base of the dam, in a confined hollow with no outlet, there was a wet area perhaps 10 ft. by 10 ft., irregularly shaped, with a few inches of standing water. It was not possible to determine whether this was seepage or a naturally landlocked, undrained zone. However, the topography appears to favor the latter possibility.

At the end of the 20 in. dia. outlet pipe, there was standing water, with a persistent flow totalling perhaps 0.4 gpm from across the top of the cap stone to the headwall, and from the right hand junction of the dam embankment with the original ground. Steady seep was also heard from the interior of the outlet headwall, where apparently water was flowing along both sides of the

pipe; it could not be determined whether any flow was actually coming through the partly submerged pipe itself. The origin of the seepage at the embankment junction was approximately 15 ft. upslope from the pipe, and the majority of the seepage issued from this zone. Much of it spread well downstream beyond the outlet area, but a significant amount flowed directly into the outlet area. Another source of seepage was apparent about 25 ft. further downstream of the outlet, about 5 to 6 ft. upslope on the right side. This latter seep was perhaps on the order of .05 to .1 gpm. (See Photo No's. 5 & 6, Appendix C).

On the downstream slope, there was a great deal of forest litter, cut brush and saplings from slope cleaning operations, making it all but impossible to check for rodent infestation. The depth of wood chippings, for example, ranged from 6 in. to one ft.

c. Appurtenant Structures. The 30 ft. wide masonry spillway channel, or wasteway, is located on the right abutment of the dam adjacent to the earth embankment. The upstream channel was spanned by a badly deteriorated steel truss bridge with only part of the timber decking intact. (See Photo No's. 11 & 12, Appendix C). The spillway entrance had become partly choked with debris, silt and growing bushes. Wooden flashboards 1.8 ft. high were installed on the spillway sill, apparently on a permanent basis since they were held in place by concrete backing. (See Photo No's. 7 & 8, Appendix C). There was only about 10 in. of freeboard between the top of the flashboards and the top of the spillway walls. (See Photo No. 9, Appendix C). A discharge of more than 10 in. depth over the flashboards would therefore overtop the side walls, which could lead to a washout of the spillway and to erosion of the toe of the dam embankment.

The masonry discharge channel has training walls which are about 2.5 ft. high. There were a number of locations along the floor of the channel where the masonry was starting to deteriorate. The downstream end of the wasteway discharge channel was also becoming overgrown with trees. (See Photo No. 10, Appendix C). A wet well with gate house is located in the reservoir at the upstream toe of the embankment about 95 ft. from the crest and opposite the midpoint of the dam. The gate house contains a 20 in. manual gate valve for controlling a 20 in. dia. outlet pipe. The access catwalk has been removed, ostensibly to avoid vandalism. The gate house was not inspected, but its mechanism was reported to be operative.

d. Reservoir Area. The shoreline of the reservoir is steep, well wooded and has rock close to the surface, and therefore might be presumed stable. However, at Merrimere Reservoir, located about 1,500 ft. south of Hallmere Reservoir, there is evidence on the steep northwest slopes of rock slides. There are no houses along the shoreline of the reservoir.

e. Downstream Channel. Beyond its confluence with the wasteway, John Hall Brook flows through a heavily wooded area and has become quite overgrown.

Some 1,500 ft. downstream of the dam, the stream crosses and recrosses Edgewood Road. In this area a gas line consisting of 30 in. dia. and 26 in. dia. parallel pipes also crosses the brook. There is about 3 ft. of cover from the stream bed to the crown of the gas pipes. About 1 mi. below the dam the brook passes through two 48 in. dia. culvert pipes, under Orchard Road just prior to entering Kenmere Reservoir. There is about 2 ft. of cover from the crown of Orchard Road to the crown of the culvert.

3.2 Evaluation

The visual inspection has adequately revealed key characteristics of the dam as they may relate to its stability and integrity. The dam and appurtenant works are judged to be fair condition. The upstream slope is becoming overgrown and has some large animal burrows, while the downstream slope has a covering of brush and small trees. Seepage was noted in the vicinity of the outlet pipe headwall and at other locations on the downstream slope. The spillway walls are only 10 in. higher than the top of the permanently installed flashboards.

SECTION 4 - OPERATIONAL PROCEDURES

4.1 Procedures

The Hallmere Reservoir Dam is operated by personnel of the Meriden Water Department. Reservoir operation entails mainly the release of stored water from Hallmere Reservoir to Kenmere Reservoir as water supply needs warrant. No documented operating procedures have been prepared.

4.2 Maintenance of Dam

Little maintenance is required except for cutting of brush and tree growth on the crest and slopes of the dam. No documented maintenance instructions have been prepared.

4.3 Maintenance of Operating Facilities

It is presumed that some maintenance to the outlet gate valve has been performed in the past to keep the mechanism operative. The bridge over the spillway which provides access to the dam from Reservoir Ave. has not been maintained in recent years. It has now deteriorated to the point where it is a hazard and it should be replaced or removed. The flashboards have been fixed in place by means of concrete backings and now constitute a semi-permanent part of the spillway structure.

4.4 Description of any Warning System in Effect

No warning system is in effect at Hallmere Reservoir Dam.

4.5 Evaluation

Although little is known about the construction of the facility, it has simple operating devices and as such requires no detailed operating procedures. Maintenance involves periodic growth removal from the embankment and surveillance regarding seeps, slope damage, animal burrows, etc. The outlet operating gate requires checking periodically and repairs should be made as necessary. The wasteway should also be checked and repaired as necessary. If flashboards are to be used in the future, a means for facilitating their rapid removal under a full head of water should be installed. A formal warning and emergency evacuation system should be developed.

SECTION 5 - HYDRAULIC/HYDROLOGIC

5.1 Evaluation of Features

a. General. Hallmere Reservoir Dam is an earthfill embankment impounding a normal storage of about 440 acre-ft. with provision for an additional 145 acre-ft. of capacity in its surcharge space to the top of the dam. It is basically a low surcharge-low spillage facility used for water supply purposes. The 30 ft. wide spillway with 1.8 ft. high permanent flashboards is capable of discharging about 1,470 cfs with surcharge to the top of the dam; the spillway training walls, however, would be overtopped by 4.9 ft. The general topographic characteristic of the 1.02 sq. mi. (650 acres) drainage basin is best described as rolling to mountainous terrain which rises from 329.0 MSL at the spillway crest to about elevation 910 MSL. The area is entirely forested.

b. Design Data. There is no design data available for this dam.

c. Experience Data. No records are available in regard to past operation of the reservoir, nor of surcharge encroachments and flows through the spillway. The maximum past inflows are unknown.

d. Visual Observations. There are no present evidences either along the reservoir or in the downstream channel to indicate high water levels or signs of any major spillway outflows. No one contacted could recollect any such occurrences.

e. Test Flood Analysis. Reservoir area and capacity curves and tables, for use in flood routings, are shown on Sheets D-1, D-2 and Fig. 1, Sheet D-3, Appendix D. For determining surface areas and surcharge capacities, planimetered areas were taken from contours delineated on USGS 2,000 ft. per in. quadrangle sheets.

The test flood chosen to evaluate the hydrologic and hydraulic capacity of Hallmere Reservoir Dam was selected in accordance with the criteria presented in the Recommended Guidelines for Safety Inspection of Dams. Since this dam is classified as intermediate in size with a high hazard potential, a test flood of magnitude corresponding to the Probable Maximum Flood (PMF) was selected for the evaluation.

Precipitation data was obtained from Hydrometeorological Report No. 33, which for the Connecticut area approximates 24.0 in. of 6 hour point rainfall over a 10 square mile area. This value was then reduced by 20 percent to allow for basin size, shape and fit factors. The 6 hour rainfall was distributed into one hour incremental periods as suggested in COE Publication EC 1110-2-1411.

A triangular incremental unitgraph was assumed for the inflow hydrographs, using a computed lag time value of 1.40 hours to derive a time-to-peak for the triangular hydrograph of 1.6 hours (See computations of Sheets D-4 through D-8 Appendix D). A test flood inflow hydrograph is shown on Fig. 2, Sheet D-8, Appendix D, indicating a peak inflow of about 3,200 cfs or a CSM of about 3,140.

Discharge tables and curves for the spillway and for over the top of the dam are shown on Sheets D-9 and D-10 and Fig. 3 Sheet D-11, Appendix D.

Flood routings were performed for both ½ and full PMF. Results of these routings are shown on Sheets D-12, D-13 and D-14 and are summarized as follows:

Flood Magnitude	Max. Routed Outflow cfs	Max. Res. El. ft. MSL	Max. Head Over Dam ft.
½ PMF	1,275	333.6	0.0
PMF (Test Flood)	2,900	334.7	0.7

From the above table, it can be seen that the project will not pass the routed test flood outflow without overtopping the dam by 0.7 ft. The project, however, can handle 51% of the routed test flood outflow without overtopping the dam.

It should be noted that, while the spillway opening could theoretically handle about 51% of the routed test flood outflow, the side training walls would be overtopped by 4.9 ft.; it is also doubtful whether the discharge channel could handle such a flow. The 2.5 ft. high masonry training walls lining the spillway chute would also probably be overtopped during high flows. Overtopping of these walls could result in erosion of the downstream toe of the dam, a washout of the spillway and chute, and possible undermining of the dam embankment.

Drawdown of the reservoir is possible through a 20 in. dia. blowoff pipe.

f. Dam Failure Analysis. As discussed above, the dam would be overtopped by the routed test flood outflow. Also, a breach owing to structural failure of the dam by piping or sloughing is a possibility. For this analysis a breach was assumed with the water level at the top of dam. The "rule of thumb' criteria suggested in the NED March 1978 Guidance Report was used for the breach analysis. With a breach width of 40 percent of the dam length at mid-height or about 100 feet, an outflow of about 50,750 cfs would be realized. (See Sheets D-15 through D-21, Appendix D).

Outflow from Hallmere Reservoir closely parallels Edgewood Road, crossing it in three locations before entering Kenmere Reservoir approximately 5,000 ft.

downstream. Flooding due to a structural failure of Hallmere Reservoir as described above would result in extensive damage to about 2,300 feet of Edgewood Rd., to the Algonquin Gas Line (two pipes), and to eleven homes located within the flood plain area (Shown on Fig. 5, Sheet D-22, Appendix D), and would wash out Orchard Road.

Estimated flood depths range from about 21 ft. at 1,500 ft. downstream to approximately 11 ft. at 5,000 ft. downstream, where the main stream joins with another smaller tributary just prior to entering Kenmere Reservoir. This area widens out considerably, accounting for the substantial reduction in stage height. When compared with the stage of the stream just prior to failure of the dam the flood stage is 13 ft. higher at a point 1,500 downstream and about 6 ft. higher 5,000 ft. downstream of the dam.

Although Kenmere Reservoir Dam was not inspected, it is probable that an inflow of the order of 14,000 cfs resulting from failure of Hallmere Reservoir Dam would cause Kenmere Dam to be overtopped.

SECTION 6 - STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations. The field investigation revealed no significant displacements or distress which would warrant the preparation of structural stability calculations based on assumed soil properties and engineering factors. The dam appeared to be stable, but deficiencies described under Section 7 should be corrected.

b. Design and Construction Data. Drawings, dated May 14, 1897, were reviewed in the office of the Director of Public Works and City Engineer. They showed comparative plans and profiles of the dam, as designed, and as actually built. Major changes appear to have been an extension of the concrete core wall some 67 ft. to the west, and an increase of its depth by as much as 36 ft. On the east side, the wall was lengthened 55 ft., extending under the wasteway as a 7-ft. deep cut-off wall.

In the right-center section, the footing of the wall was raised as much as 22 ft., with stepped foundations on "hard pan". The center of the wall appears to be founded on "clay" for 60 ft., with the flanking portions being on "hard pan".

No plans or calculations of value to a stability assessment are available.

c. Operating Records. Operating records are maintained by the City of Meriden's Public Works Department at the City Hall. There are no operating records of any significance to structural stability.

d. Post-Construction Changes. There are no known post-construction changes which would adversely affect the stability or integrity of the dam.

e. Seismic Stability. The dam is located in Seismic Zone No. 1, and in accordance with Phase I guidelines, does not warrant seismic analyses.

SECTION 7
ASSESSMENT, RECOMMENDATIONS & REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition. On the basis of the Phase I visual examination, Hallmere Reservoir Dam appears to be in fair condition at the present time. The deficiencies revealed indicate that further investigations are required. The principal items of concern are the use of flashboards and the seepage zones at the downstream toe of the dam.

There is also a considerable amount of growth on the crest and slopes of the dam, as well as an accumulation of debris at the downstream toe.

b. Adequacy of Information. The lack of in-depth engineering data did not permit a definitive review. Therefore, the adequacy of the dam cannot be assessed from a standpoint of reviewing design and construction data. This assessment is based primarily on the visual inspection, past performance, and sound engineering judgment.

c. Urgency. The recommendations and remedial measures enumerated below should be implemented by the owner within one year after receipt of this Phase I Inspection Report.

d. Need for Additional Investigations. Additional investigations are required as recommended in Para. 7.2.

7.2 Recommendations

It is recommended that the owner should retain the services of a competent registered professional engineer to make investigations and studies of the following, and if proved necessary, to design appropriate remedial works:

(1) Make a thorough study of the hydrology of the drainage area. Evaluate further the potential for overtopping and the inadequacy of the spillway.

(2) Review the use of flashboards on the spillway crest and determine the feasibility of either eliminating their use altogether, or modifying them to facilitate quick removal in anticipation of a storm.

(3) Review flow conditions in the spillway and discharge channel and determine whether modifications are required to forestall overtopping of the walls.

(4) Investigate the seepage zones at the downstream toe in the vicinity of the outlet pipe; determine the advisability of incorporating graded filters with channelization to facilitate monitoring and assessment of flow changes.

7.3 Remedial Measures

a. Operation and Maintenance Procedures.

(1) The upstream and downstream slopes of the embankment should be entirely cleared of vegetative growth, including massive tree stumps. Extraction of larger roots should be followed by meticulous backfilling, with suitable material, well compacted. Rodent burrows should also be backfilled.

(2) Riprap on the upstream face should be restored, and the many voids backfilled and chinked. Consideration should be given to the control of burrowing rodents.

(3) The spillway should be cleaned of growth and debris.

(4) Repairs to the floor of the wasteway should be made where necessary.

(5) The deteriorated truss bridge should be either totally removed, or reconstructed with access control.

(6) Reconstruction of the access bridge to the control tower should be considered in order to facilitate operations during periods of heavy rainfall.

(7) A formal surveillance and flood warning plan should be developed.

(8) Procedures for an annual periodic technical inspection of the dam and appurtenant works should be instituted.

7.4 Alternatives

A practical alternative to 7.2 (1) above is for the owner to operate the reservoir at a lower level throughout the year so as to provide more surcharge storage for extreme flood events.

APPENDIX A

INSPECTION CHECKLIST

VISUAL INSPECTION CHECKLIST
PARTY ORGANIZATION

PROJECT Hallmere Reservoir Dam DATE 24 April & 9 May 1979

TIME 10 A.M.

WEATHER Clear

W.S. ELEV. 329.1 U.S. DN.S.

PARTY:

1. Peter B. Dyson
2. Pasquale E. Corsetti
3. Roger F. Berry
4. Carl J. Hoffman
5. James Reynolds
6. Bruce Soroka
7.
8.
9.
10.

PROJECT FEATURE	INSPECTED BY	REMARKS
1. Hydraulics/Structures	Carl J. Hoffman	
2. Soils and Geology	James Reynolds	
3. Hydrologic	Roger F. Berry	
4. General Features	Peter B. Dyson	
5. General Features	Pasquale E. Corsetti	
6.		
7.		
8.		
9.		
10.		

PERIODIC INSPECTION CHECKLIST

PROJECT Hallmere Reservoir Dam DATE 24 April & 9 May 1979

PROJECT FEATURE Dam NAME

DISCIPLINE Soils/Geology NAME James Reynolds

AREA EVALUATED	CONDITIONS
DAM EMBANKMENT	
Crest Elevation	344.0
Current Pool Elevation	329.1
Maximum Impoundment to Date	Unknown
Surface Cracks	Many voids in upstream riprap, unknown if rodent caused
Pavement Condition	Not applicable
Movement or Settlement of Crest	None
Lateral Movement	None
Vertical Alignment	Good
Horizontal Alignment	Good
Condition at Abutment and at Concrete Structures	Masonry Spillway - Good
Indications of Movement of Structural Items on Slopes	None
Trespassing on Slopes	Crest heavily worn, apparently by motorcyclists from alternate access
Sloughing or Erosion of Slopes or Abutments	Some erosion, upstream face, west half
Rock Slope Protection - Riprap Failures	Riprap rather small, many voids, discontinuous on western half.
Unusual Movement or Cracking at or near Toes	None
Unusual Embankment or Downstream Seepage	See Note (1)
Piping or Boils	None
Foundation Drainage Features	None discernible, or shown on drawings
Toe Drains	None discernible, or shown on drawings
Instrumentation System	None discernible, or shown on drawings

Note (1) Seepage at 0.4 gpm at middle of downstream toe through and around outlet pipe and stone housing, and from upslope junction of embankment and original ground. Additional seepage, at 0.5 to 0.1 gpm, 25 ft. downstream of outlet and 5 ft. upslope. Flow clear.

PERIODIC INSPECTION CHECKLIST

PROJECT Hallmere Reservoir Dam DATE 24 April & 9 May 1979

PROJECT FEATURE Gate House & Outlet NAME

DISCIPLINE Structures NAME Carl J. Hoffman

AREA EVALUATED	CONDITIONS
OUTLET WORKS - CONTROL TOWER	
a. Concrete and Structural	Note: Gate house accessible only by boat; therefore, gate house seen only from crest of dam. It appears to be in good condition.
General Condition	
Condition of Joints	
Spalling	
Visible Reinforcing	
Rusting or Staning of Concrete	
Any Seepage or Efflorescence	
Joint Alignment	
Unusual Seepage or Leaks in Gate Chamber	
Cracks	
Rusting or Corrosion of Steel	
b. Mechanical and Electrical	N/A
Air Vents	
Float Wells	
Crane Hoist	
Elevator	
Hydraulic System	
Service Gates	
Emergency Gates	
Lighting Protection System	
Emergency Power System	
Wiring and Lighting System in Gate Chamber	

PERIODIC INSPECTION CHECKLIST

PROJECT Hallmere Reservoir Dam DATE 24 April & 9 May 1979

PROJECT FEATURE Outlet Channel NAME

DISCIPLINE Structures/Hydraulics NAME Carl J. Hoffman

AREA EVALUATED	CONDITIONS
OUTLET WORKS - OUTLET STRUCTURE AND OUTLET CHANNEL	
General Condition of Concrete	Masonry headwall in fair condition.
Rust or Staining	N/A
Spalling	N/A
Erosion or Cavitation	N/A
Visible Reinforcing	N/A
Any Seepage or Efflorescence	Yes, seepage apparent around outlet pipe
Condition at Joints	N/A
Drain Holes	N/A
Channel	
Loose Rock or Trees Overhanging Channel	Yes
Condition of Discharge Channel	Heavily silted and covered with vegetation

PERIODIC INSPECTION CHECKLIST

PROJECT Hallmere Reservoir Dam DATE 24 April & 9 May 1979

PROJECT FEATURE Spillway NAME

DISCIPLINE Structures/Hydraulics NAME Carl J. Hoffman

AREA EVALUATED	CONDITIONS
OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS	
a. Approach Channel	(Masonry)
General Condition	Fair
Loose Rock Overhanging Channel	None
Trees Overhanging Channel	Saplings in Channel
Floor of Approach Channel	Covered with silt and debris
b. Weir and Training Walls	(Masonry with flashboards)
General Condition of Concrete	N/A (Masonry - fair)
Rust or Staining	None
Spalling	None
Any Visible Reinforcing	N/A
Any Seepage or Efflorescence	None
Drain Holes	None
c. Discharge Channel	(Masonry)
General Condition	Fair
Loose Rock Overhanging Channel	None
Trees Overhanging Channel	Trees in Channel
Floor of Channel	Debris in lower end
Other Obstructions	None

PERIODIC INSPECTION CHECKLIST

PROJECT Hallmere Reservoir Dam DATE 24 April & 9 May 1979

PROJECT FEATURE Spillway Bridge NAME

DISCIPLINE Structures NAME Carl J. Hoffman

AREA EVALUATED	CONDITIONS
OUTLET WORKS - SERVICE BRIDGE	
a. Superstructure	Steel truss bridge spanning spillway
Bearings	Poor
Anchor Bolts	Poor
Bridge Seat	Poor
Longitudinal Members	Poor (beyond repair)
Underside of Deck	Poor
Secondary Bracing	Poor (beyond repair)
Deck	Poor (part missing)
Drainage System	None
Railings	Fair
Expansion Joints	None
Paint	Poor
b. Abutment & Piers	Masonry
General Condition of Concrete	Good
Alignment of Abutment	Good
Approach to Bridge	Obstructed by concrete blocks
Condition of Seat and Backwall	

PERIODIC INSPECTION CHECKLIST

PROJECT Hallmere Reservoir Dam DATE 23 April & 9 May 1979

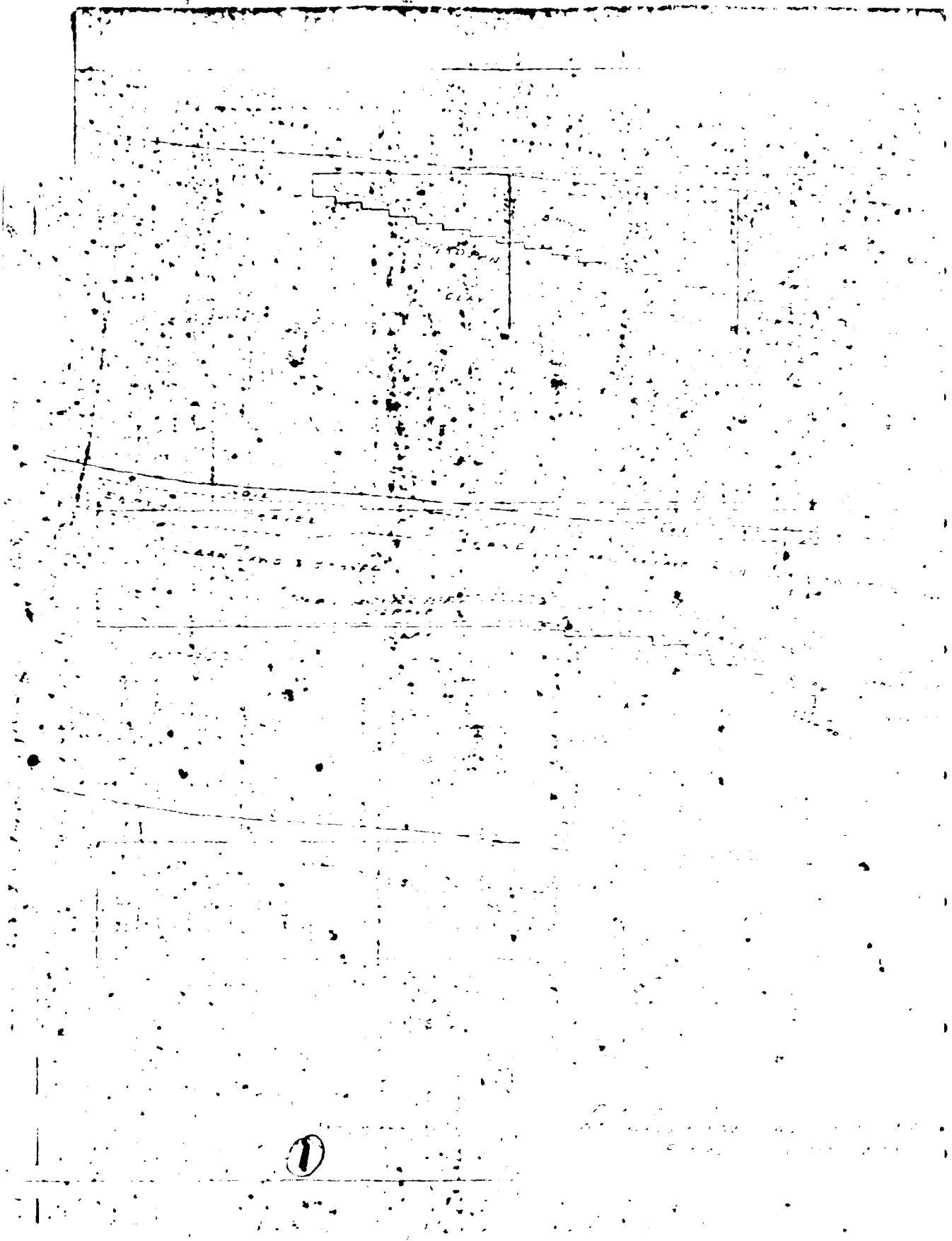
PROJECT FEATURE _____ NAME _____

DISCIPLINE _____ NAME _____

AREA EVALUATED	CONDITIONS
- Dike Embankment	NA
- Outlet Works - Intake Channel and Intake Structure	NA
- Outlet Works - Transition and Conduit	NA

APPENDIX B

ENGINEERING DATA



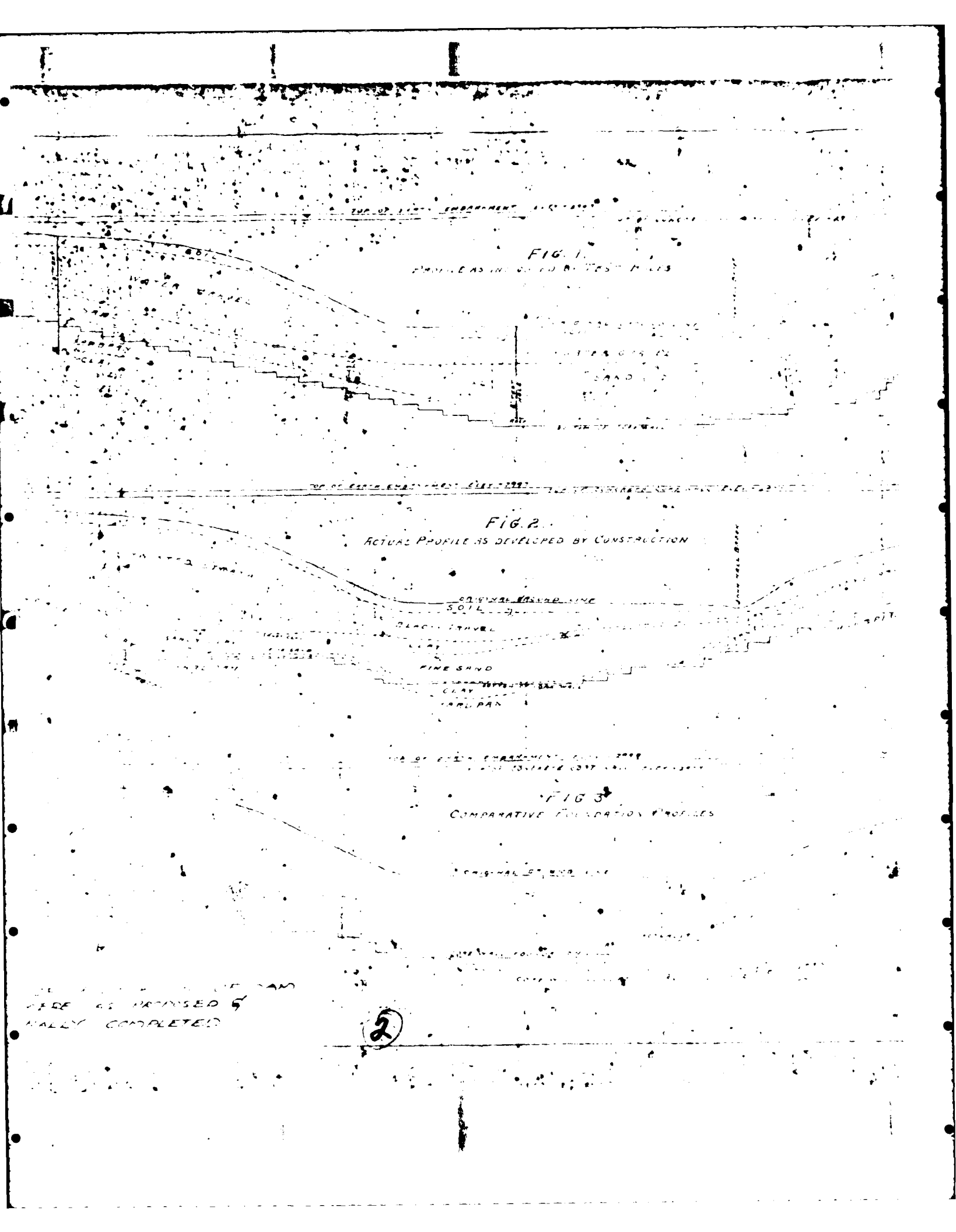


FIG. 1.
FIG. 2.
ACTUAL PROFILE AS DEVELOPED BY CONSTRUCTION
ORIGINAL GROUND LINE
SOIL
BLACK GRAVEL
CLAY
FINE SAND
CLAY
HARDPAN
FIG 3
COMPARATIVE FOUNDATION PROFILES

(2)

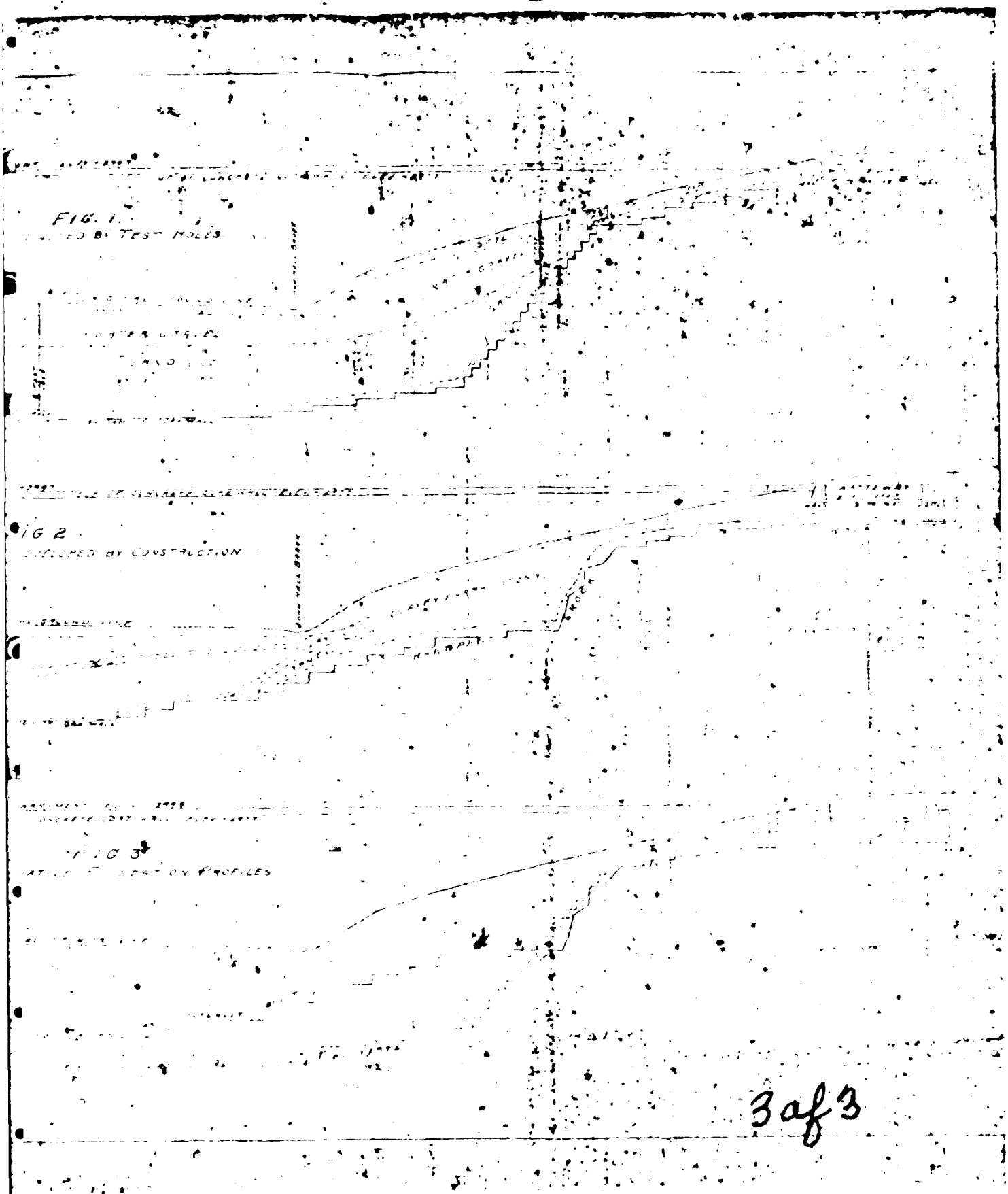
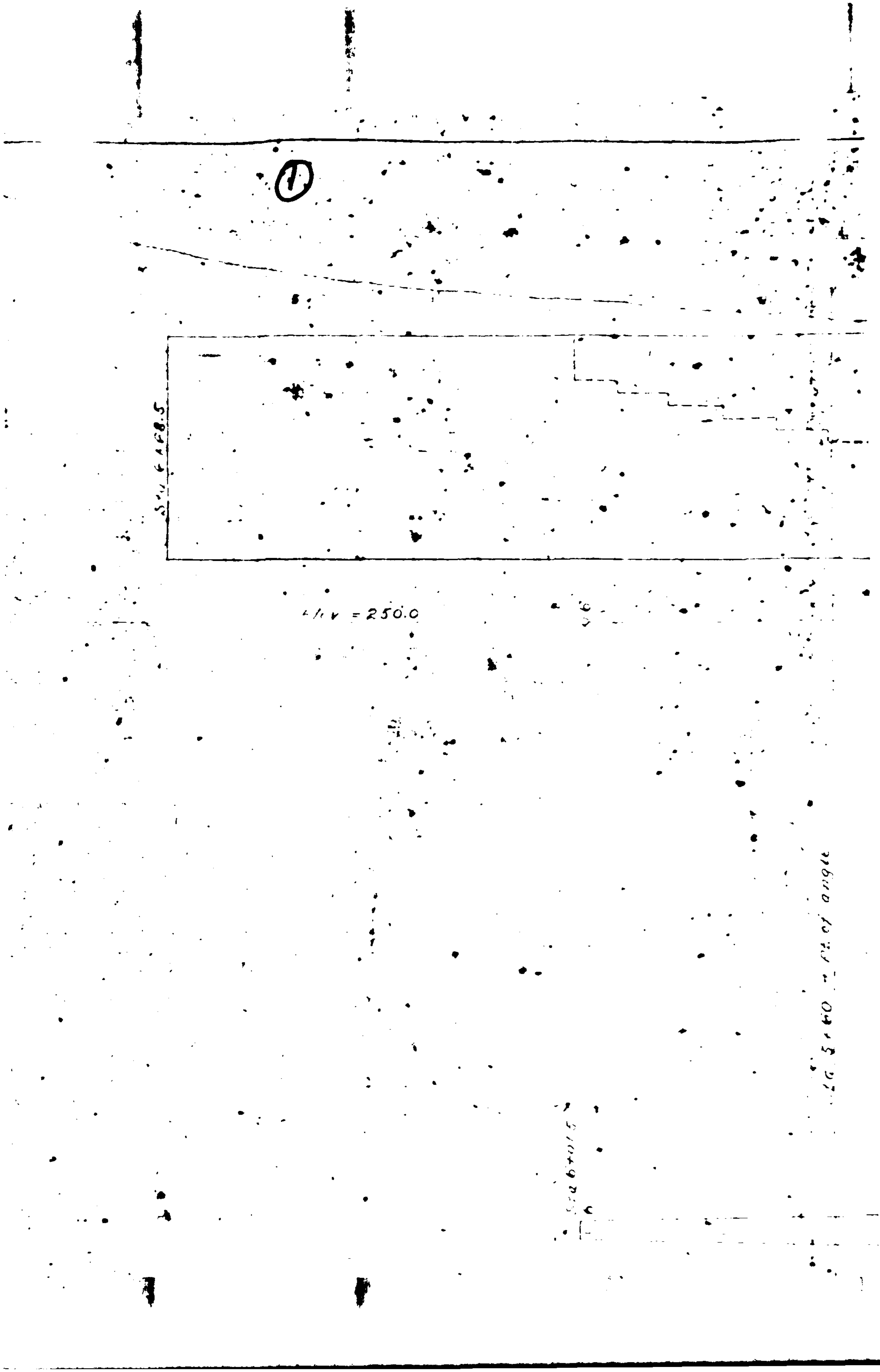


FIG. 1.

FIG 2.

FIG 3

3 of 3


1
= 250.0

PLAN SHOWING

CHANGES IN CONCRETE C

FROM ORIGINAL DESIGN.

May 14, 1897. Scale 20'

Lg. 5 = 60 = Pt. of angle

(3)

TOP OF CORE WALL

ORIGINAL GROUND LINE

BOTTOM OF CORE WALL

ORE WALL

(4)

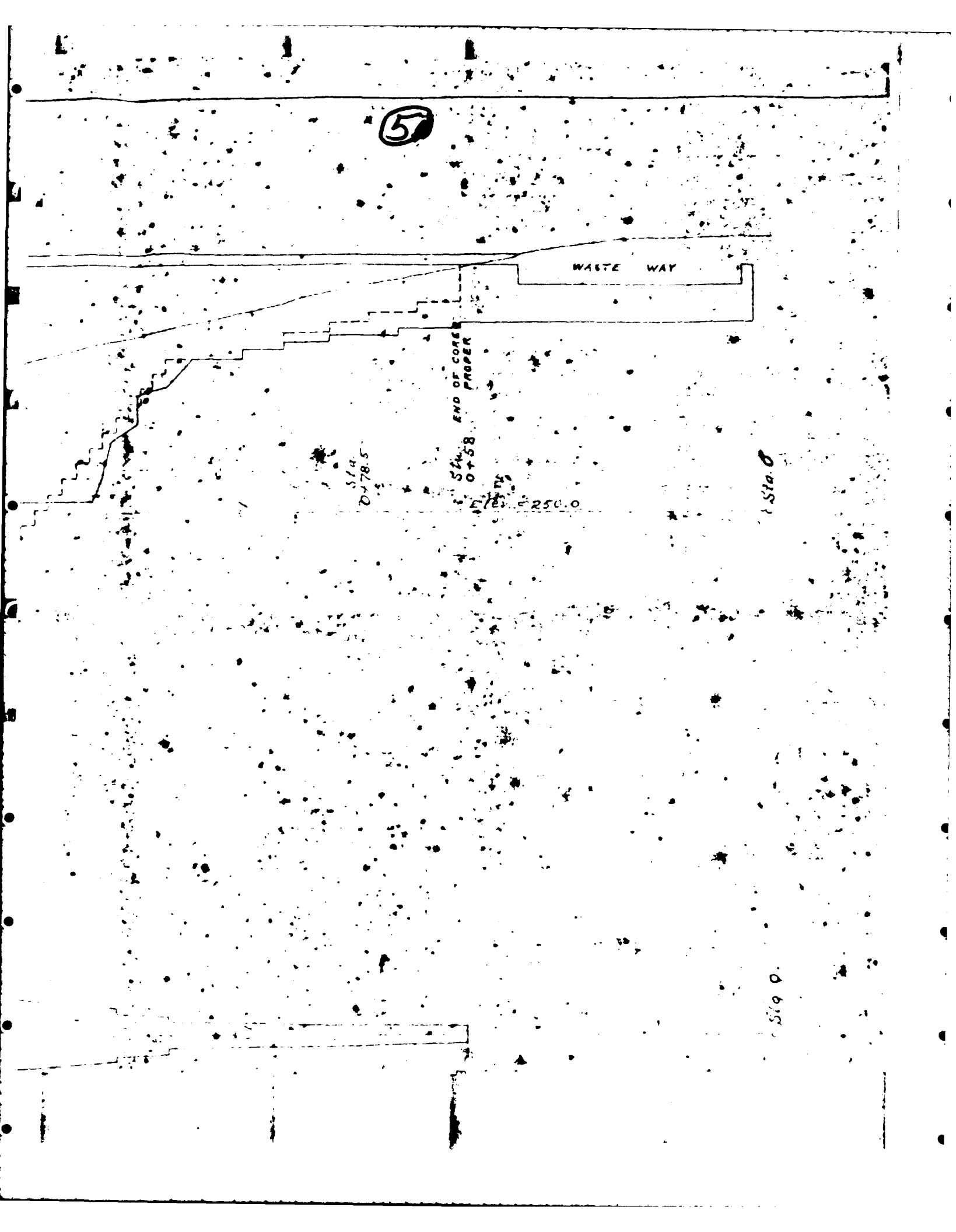
TOP OF WALL ELEV. = 299.7

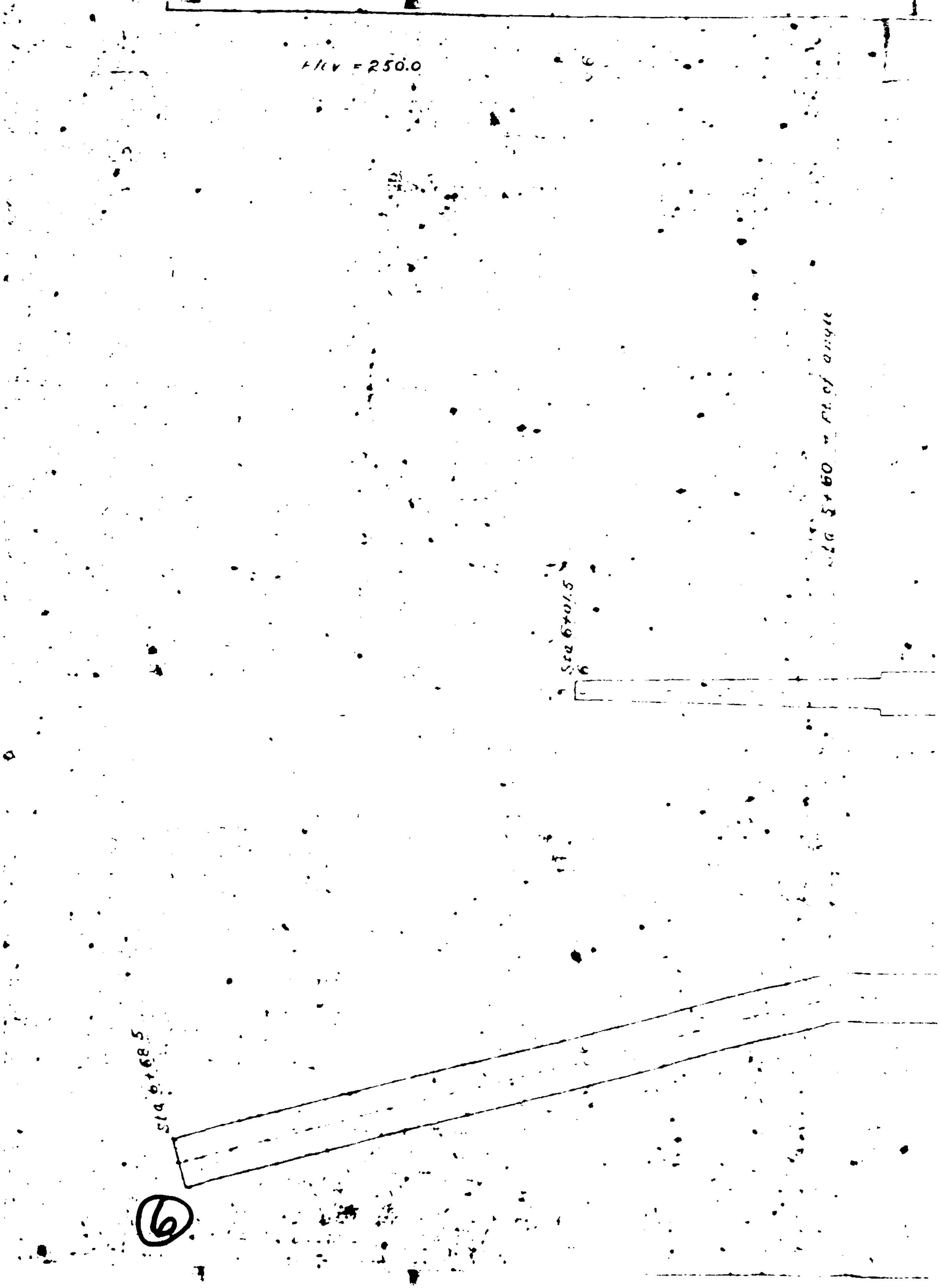
TOP OF TOE WALL ELEV = 297.7

GROUND LINE

BOTTOM OF CUT AS ACTUALLY CONSTRUCTED

BOTTOM OF CUT AS SHOWN ON ORIGINAL PLAN


5
WASTE WAY
END OF CORE PROPER
Sta 0+58
Sta 0+78.5
Sta 0
Sta 0



6

PLAN SHOWING

CHANGES IN CONCRETE CO

FROM ORIGINAL DESIGN.

May 14, 1897. Scale 20' = 1"

Sta 5+60 = Pt. of angle

(7)

GROUND PLAN AS ORIGINALLY DESIGNED

GROUND PLAN AS ACTUALLY BUILT.

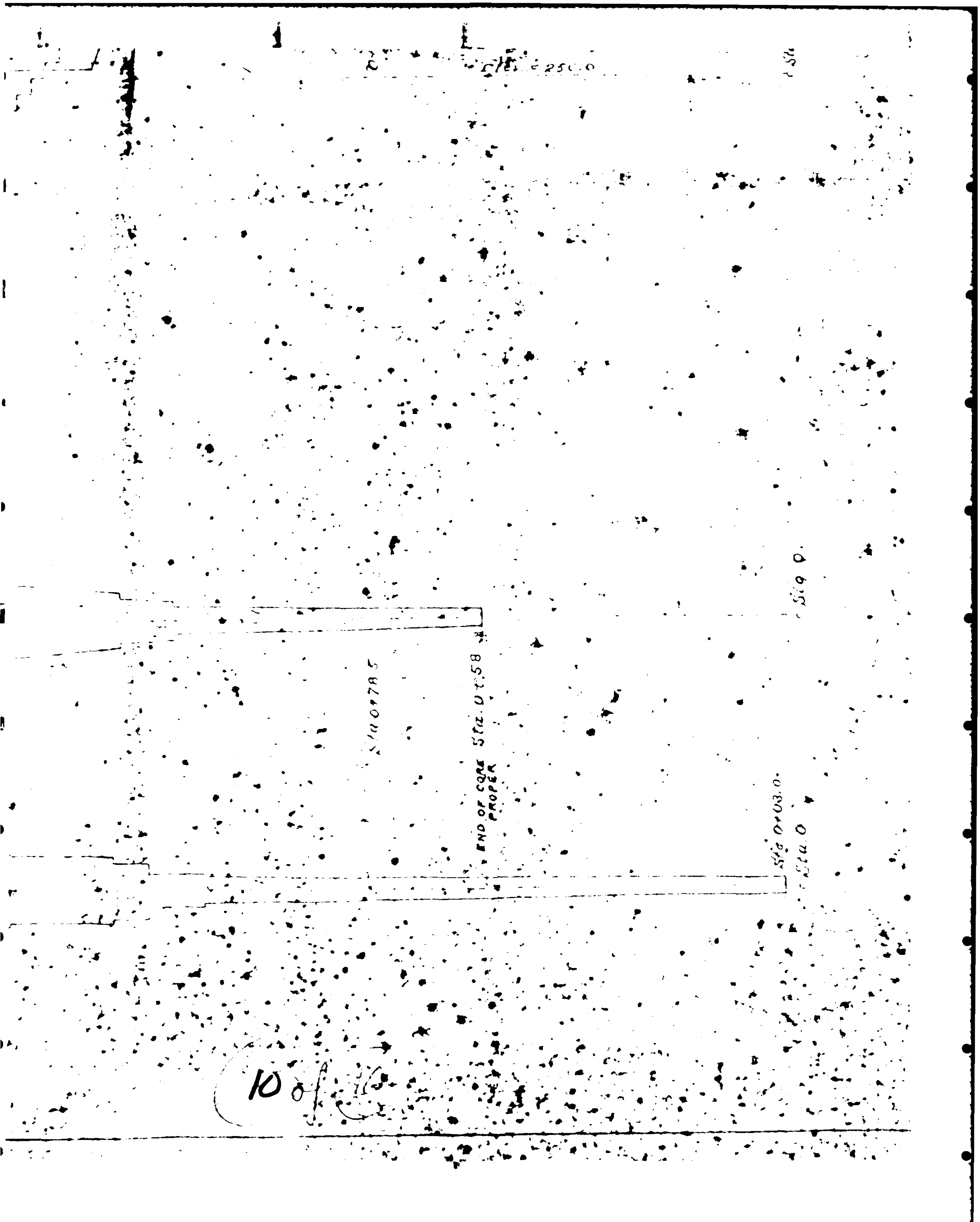
DLVD LINE

CW OF CURVE AS ACTUALLY CONSTRUCTED

AS THEY EXIST BELOW FORE SHOWN ON ORIGINAL PLAN

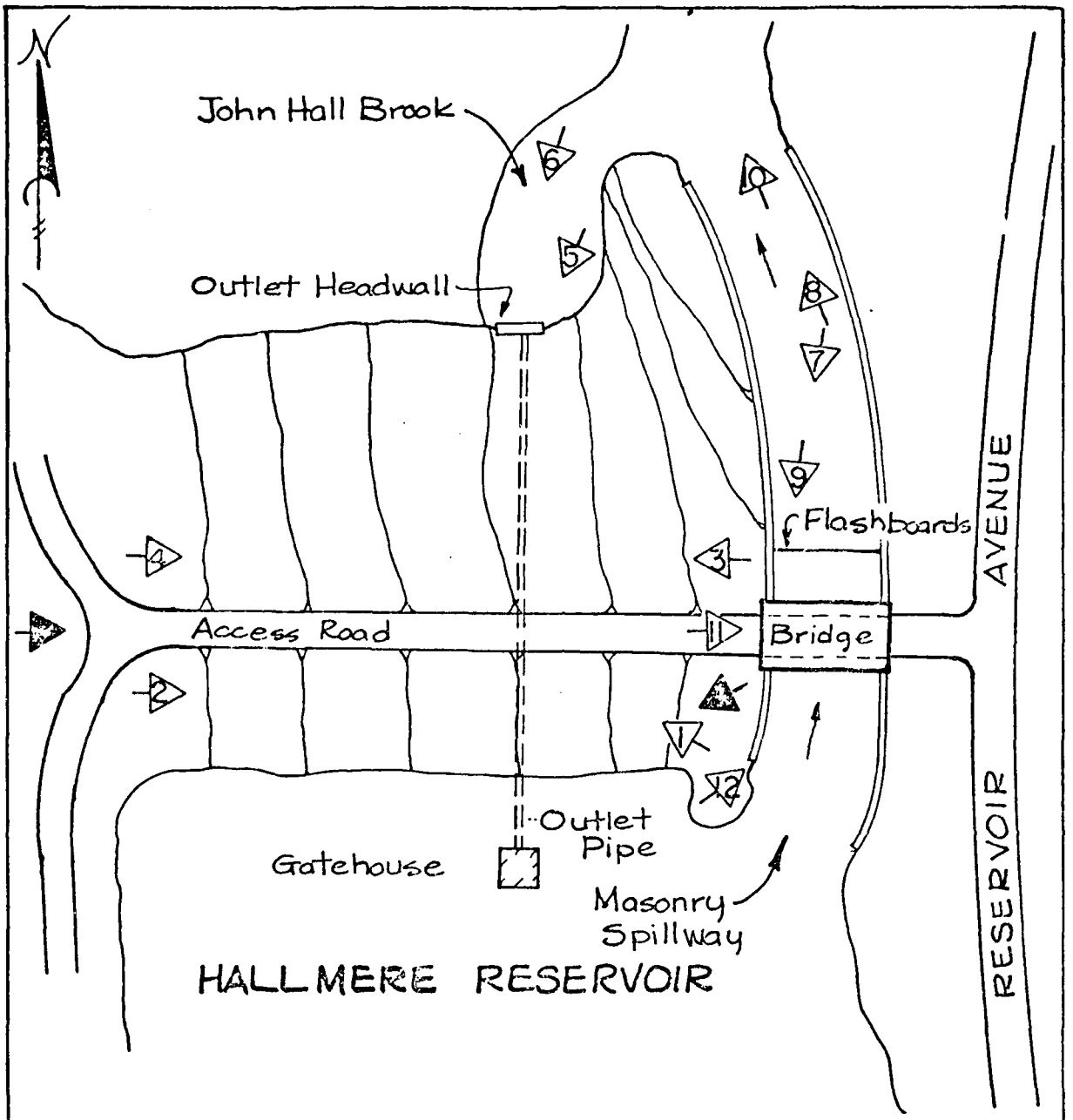
DESIGNED.

ILT.


Sta 0+78.5
END OF CORE PROPER
Sta 0+58
Sta 0+03.0
Sta 0

APPENDIX C

PHOTOGRAPHS



Appendix "C" Photos

Overview Photos

LOUIS BERGER & ASSOC., INC WELLESLEY, MASS. ARCHITECT - ENGINEER	U.S. ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS.

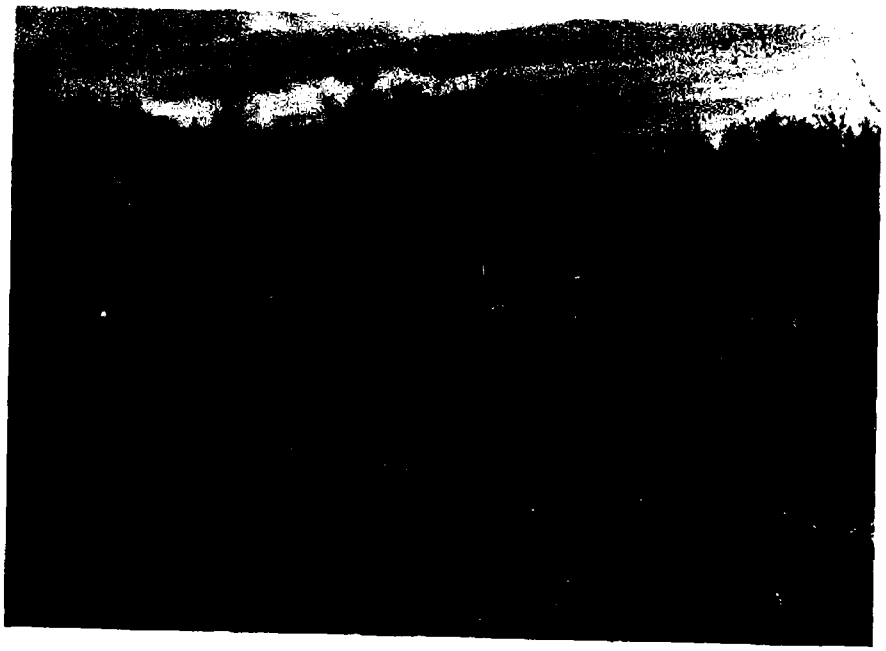
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

HALLMERE RESERVOIR DAM

SKETCH PLAN SHOWING LOCATION & ORIENTATION OF PHOTOS

STATE - CT.

			SCALE
			DATE



1. Upstream slope of dam, showing riprap and brush intrusion.

2. Upstream slope of dam, showing gatehouse and brush intrusion.

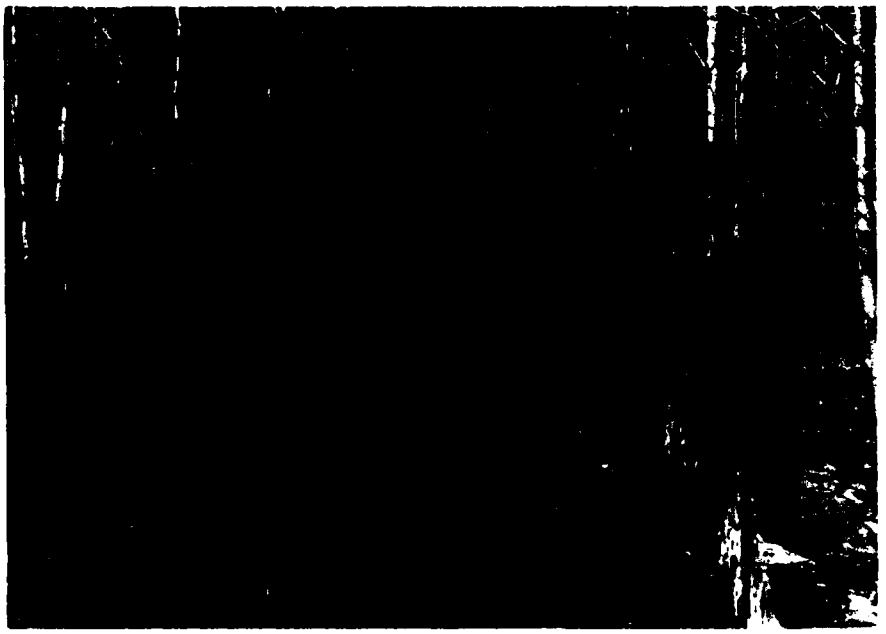
3. Downstream slope from right abutment.

4. Downstream slope from left abutment.

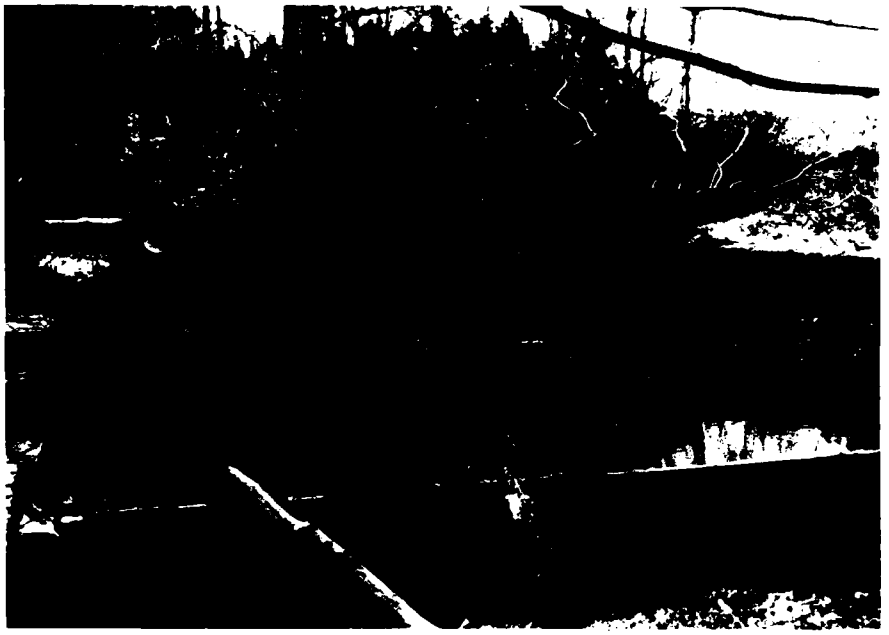
5. 20 in. dia. outlet pipe and headwall.

6. Downstream slope and outlet headwall.

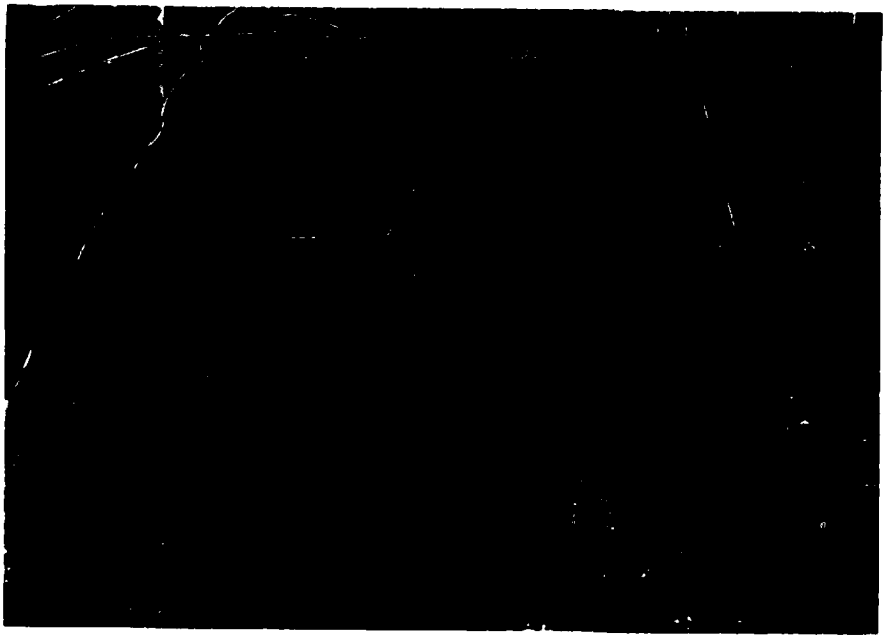
7. Spillway channel and flashboards looking upstream.



8. Downstream spillway channel.



9. View of spillway sill, flashboards and deteriorated access truss bridge.



10. Confluence of wasteway and John Hall Brook.

11. Access bridge over wasteway with decking missing.

12. Upstream view of access bridge.

APPENDIX D

HYDROLOGIC AND HYDRAULIC COMPUTATIONS

[illegible] 37

— CAPACITY OF —
"HALLMERE" RESERVOIR

AT EVERY FOOT ON GAUGE.

MEASURED NOVEMBER 1897. F.B. MOSS, CITY ENG^R

	— GAUGE —		— GALLONS	AC-FT
293.5	5	FT.	1,500,000	4.6
294.5	6	"	2200000	6.7
295.5	7	"	3050000	9.4
296.5	8	"	4,000,000	12.3
297.5	9	"	5100000	15.6
298.5	10	"	6,550,000	20.1
299.5	11	"	8,150,000	25.0
300.5	12	"	9900000	30.4
311.5	13	"	11,850000	36.4
302.5	14	"	14,100,000	43.3
303.5	15	"	16500000	50.6
304.5	16	"	19,050,000	58.5
305.5	17	"	21,950,000	67.4
306.5	18	"	25100000	77.0
307.5	19	"	28,550,000	87.6
308.5	20	"	32,000,000	98.2
309.5	21	"	35,750,000	109.7
310.5	22	"	39650000	121.7
311.5	23	"	43850,000	134.6
312.5	24	"	48,150,000	147.[illegible]
313.5	25	"	52600000	161.4

D-1

"HALLMERE" CON.

- GAUGE -			- GALLONS -	
314.5	26	FT.	57,300,000	175.8
315.5	27	"	62100000	190.6
316.5	28	"	67150000	206.1
317.5	29	"	72,350,000	222.0
318.5	30	"	77,800,000	238.8
319.5	31	"	83150000	255.2
320.5	32	"	88,700,000	272.2
321.5	33	"	94550000	290.2
322.5	34	"	100,500,000	308.4
323.5	35	"	106,650,000	327.3
324.5	36	"	112900000	346.5
325.5	37	"	119,400,000	366.5
326.5	38	"	126000000	386.7
327.5	39	"	132,850,000	407.7
328.0	39 1/2	" TOP OF OVERFLOW	136,320,000	418.4
328.5	40	"	139,800,000	429.0
329.6 TOP OF FLUSHBOARDS	40 1/2		143,300,000 ±	439.8

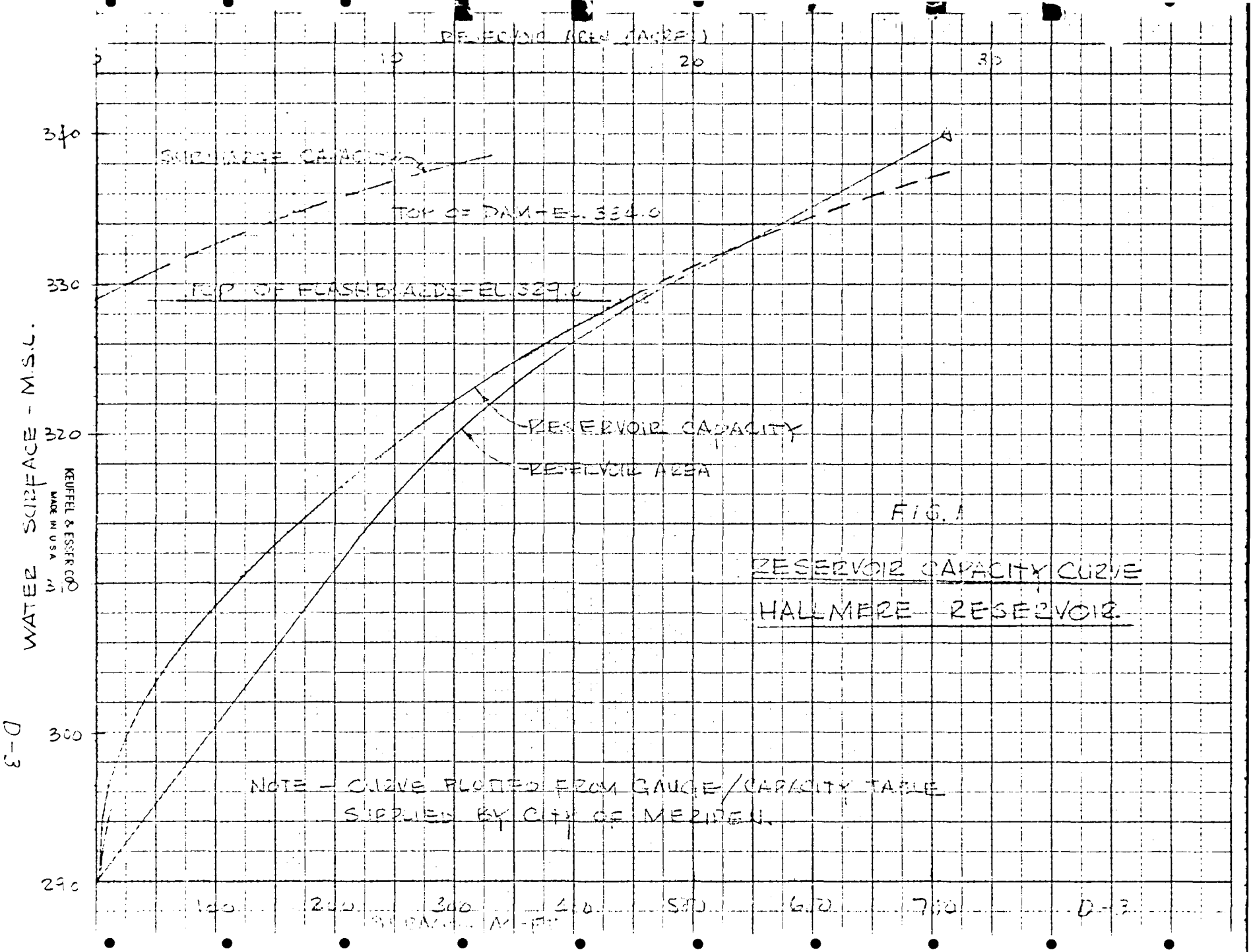


FIG. 1

RESERVOIR CAPACITY CURVE

HALLMERE RESERVOIR

BY [illegible] DATE 5.11.79 LOUIS BERGER & ASSOCIATES INC. SHEET NO 1 OF

CHKD. BY DATE INSPECTION OF DAMS PROJECT

SUBJECT HALLMERE RESERVOIR - HYDROLOGY

DRAINAGE AREA – REFER TO CITY OF MERIDEN PLAN FOR LIMIT OF DRAINAGE AREA.

MERIDEN, CONN. QUAD. SHEET - PL. 7.08 SQ. IN.

SCALE 1" = 2000 FT 1 [illegible] = 4,000,000 S.F.

$$\text{AREA} = \frac{(7.08)(4{,}000{,}000)}{43{,}560} = \boxed{650.1 \text{ ACRES}}$$

$$\frac{650 \text{ AC}}{640 \text{ AC/S.M.}} = \boxed{1.02 \text{ SQ. MI.}}$$

RESERVOIR AREA

AT ELEV. 290.0 MSL – RES. AREA = 0

(NOR. STR.) AT " 329.0 " – " " = 18.4 AC

" "

340.0 – " " = 28.5 AC

BY RLW DATE 5.11.79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. 2 OF

CHKD. BY DATE INSPECTION OF DAMS PROJECT

SUBJECT HALLMERE RESERVOIR - HYDROLOGY

A_D = 650 AC. = 1.02 SQ. M.

RESERVOIR = 2200' x 300' ± = 18.4 AC ≐ 3% OF D.A.

CAPACITY AT NORMAL STORAGE = 143,300,000 GAL
= 439.8 AC-FT (CITY)

672 AC-FT (ACoE INVENTORY)

DRAINAGE AREA - TRIBUTARY TO DRAINAGE AREA

L	ΔH	S
6,400	900-329 = 571	.089
7,700	910-329 = 581	.075
9,200	910-329 = 581	.063
5,300	480-329 = 151	.028
4 | 28,600		4 | 0.255

L_{AV} = 7150' = 1.35 MI. S_{AV} = .064 = 338 FT/MI.

LAG TIME

$$LAG = K\left(\frac{L \cdot L_{CA}}{\sqrt{S}}\right)^{0.33}$$ PG. 66 DSD $L_{CA} = \frac{L_{AV}}{2} = \frac{1.35}{2} = 0.675$

S = 338 FT/MI.

K = 3.75 - CURVE "B" MIXED TERRAIN

$$= 3.75\left(\frac{1.35 \times 0.675}{\sqrt{338}}\right)^{0.33}$$

$$= 3.75(0.0496)^{0.33} = 1.39 \text{ HRS}$$

SAY 1.4 HRS

CHECK VELOCITY $V = \frac{7,150 \text{ FT}}{1.4 \times 3600} = 1.4$ FPS OK. ✓

FROM DSD PG 70 - FOR S_{AV} = 6.4% V_{AV} = 5 FPS TPPWRS
D-5 V_{AV} = 2-3 FPS TEXAS

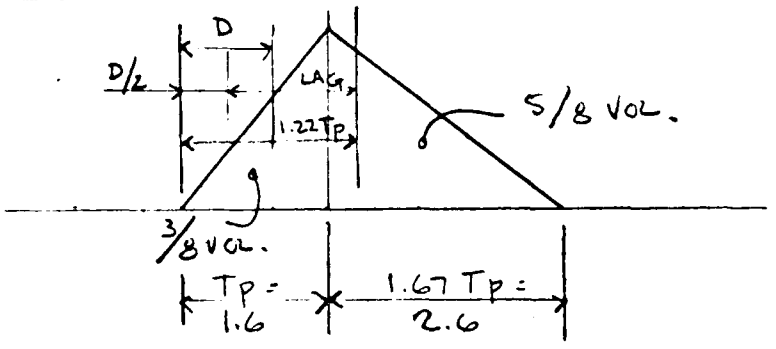
CALC. TIME TO PEAK (T_p)

$$T_p = \frac{LAG}{1.22} + \frac{D}{2(1.22)} = 0.82\,LAG + 0.42\,D$$

D = INCREMENTAL TIME PERIOD - USE 1 HR

$$T_p = 0.82(1.4) + 0.42(1) = 1.15 + .42 = 1.57 \text{ HRS}$$

$T_p = 1.6$ HRS



Q_p - Q TO PEAK

$$Q_{p_1} = \frac{484\,A\,Q}{T_p} = \frac{484(1.02)(1")}{1.6}$$

$A = 1.02$ SQ.MI.
$Q = 1.0"$
$T_p = 1.6$ HRS

$= \underline{308.6 \text{ CFS}}$

RAINFALL - 24" RAINFALL IN 6 HRS. (SET)

$PMF = 0.8(24") = 19.2$

FH FACTOR = 0.8
INFILTRATION = 0.4"

$19.2" - 0.4" = \underline{18.8 \text{ IN.}}$

BY RLG DATE 5.11.09 | LOUIS BERGER & ASSOCIATES INC. | SHEET NO. 4 OF

CHKD. BY ____ DATE ____ | INSPECTION OF DAMS | PROJECT ____

SUBJECT ____

FLOOD INFLOW HYDROGRAPH FOR PMF

$Q_{P_1} = 309$ CFS

TIME	RAINFALL % *	RAINFALL IN.	Q_P CFS	BEGIN HR	PEAK HR	END HR	
0							
1	10	1.88	581	0	1.6	4.2	
2	12	2.26	698	1	2.6	5.2	
3	15	2.82	871	2	3.6	6.2	
4	38	7.14	2206	3	4.6	7.2	
5	14	2.63	813	4	5.6	8.2	
6	11	2.07	639	5	6.6	9.2	
		18.8	5808 ✓				

* DISTRIB. OF MAX. 6 HR SPS OF PMP IN %

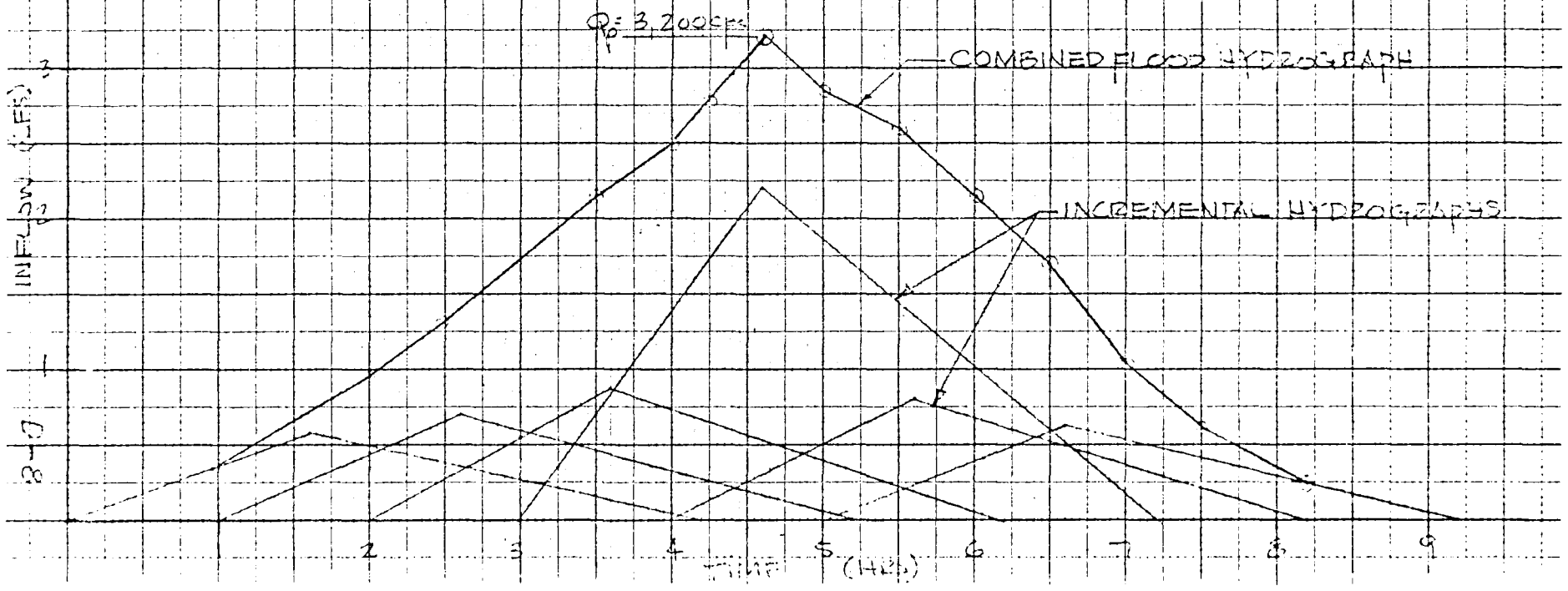
– EM1110-2-1411 (ACoE)

FIG. 2

HALLMERE RESERVOIR

INFLOW FLOOD HYDROGRAPH

FULL P.M.F.



BY [illegible] DATE 5.14.79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. 1 OF

CHKD. BY DATE INSPECTION OF DAMS PROJECT

SUBJECT HALLMERE RESERVOIR - DISCHARGE ANALYSIS

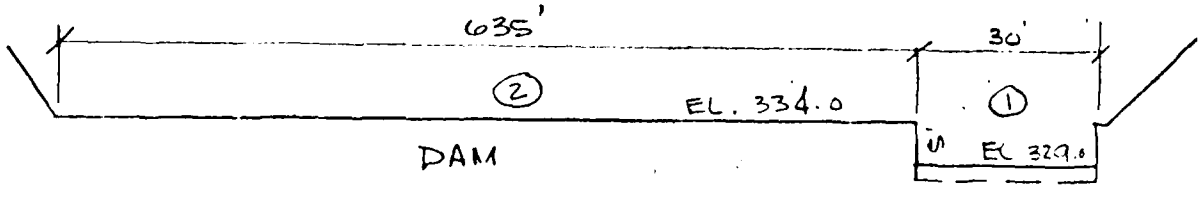
GIVEN – PERMANENT FLASHBOARDS – 1.8' HIGH = h
SPILLWAY LENGTH = 30'

FROM OCH BY V.T.CHOW - pg. 362 – $Q = CLH^{1.5}$

DISCHARGE OVER WIER $C = 3.27 + 0.40 \frac{H}{h}$

h = 1.8'

ELEV	H (FT)	H/h	C	$H^{1.5}$ (FT)	L (FT)	Q ① CFS DISCHARGE	WITHOUT FLASHBOARDS H	C	Q
329.0	0						1.8	2.9	210
329.5	0.5	.28	3.38	.35	30'	35.5	2.3	2.9	303
330.0	1.0	.56	3.49	1.0		104.7	2.8	2.9	408
330.5	1.5	.83	3.60	1.84		198.7	3.3	3.0	593
331.0	2.0	1.11	3.71	2.83		314.9	3.8	3.0	667
331.5	2.5	1.39	3.83	3.95	"	453.9	4.3	3.1	829
332.0	3.0	1.67	3.94	5.20		614.6	4.8	3.1	978
332.5	3.5	1.94	4.05	6.55		795.8	5.3	3.2	1171
333.0	4.0	2.22	4.16	8.00		998.4	5.8	3.2	1341
333.5	4.5	2.5	4.27	9.55		1223.3	6.3	3.3	1565
334.0	5.0	2.78	4.38	11.18	"	1469.0	6.8	3.3	1755
334.5	5.5	3.05	4.49	12.90		1737.6	7.3	3.4	2018
335.0	6.0	3.33	4.60	14.70		2028.6	7.8	3.4	2222
335.5	6.5	3.61	4.71	16.57		2341.3			
336.0	7.0	3.89	4.83	18.52		2683.5			
336.5	7.5	4.17	4.94	20.54		3044.0			
337.0	8.0	4.44	5.05	22.62		3426.9			
337.5	8.5	4.72	5.16	24.78	"	3835.9			
338.0	9.0	5.0	5.27	27.00		4268.7			



BY RLM DATE 5.14.79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. 2 OF

CHKD. BY DATE INSPECTION OF DAMS PROJECT

SUBJECT HALLMERE RESERVOIR - DISCHARGE ANALYSIS

DISCHARGE OVER DAM $Q = CLH^{1.5}$

	H	$H^{1.5}$	C	L	Q @ CFS DISCHARGE	
334	0					TOP DAM
334.5	.5	.35	2.8	635'	622	
335	1.0	1.0			1778	
335.5	1.5	1.84			3271	
336	2.0	2.83	"	"	5032	
336.5	2.5	3.95			7023	
337	3.0	5.20			9246	
337.5	3.5	6.55	"	"	11646	
338	4.0	8.00			14224	

SUMMARY

WITH FLASHBOARDS				W/O FLASHBOARDS	
ELEV.	SPILLWAY DISCHARGE	OVER DAM DISCHARGE	TOTAL	SPILLWAY	TOTAL
329.0	0		0	210	210
329.5	35		35	303	303
330.0	105		105	408	408
330.5	199		199	593	593
331.0	315		315	667	667
331.5	454		454	829	829
332.0	615		615	978	978
332.5	796		796	1171	1171
333.0	998		998	1341	1341
333.5	1223		1223	1565	1565
334.0	1469	0	1469	1755	1755
334.5	1738	622	2360	2018	2640
335.0	2029	1778	3807	2222	4000
335.5	2341	3271	5612		
336.0	2684	5032	7716		
336.5	3044	7023	10067		
337.0	3427	9246	12673		
337.5	3836	11646	15482		
338.0	4269	14224	18493		

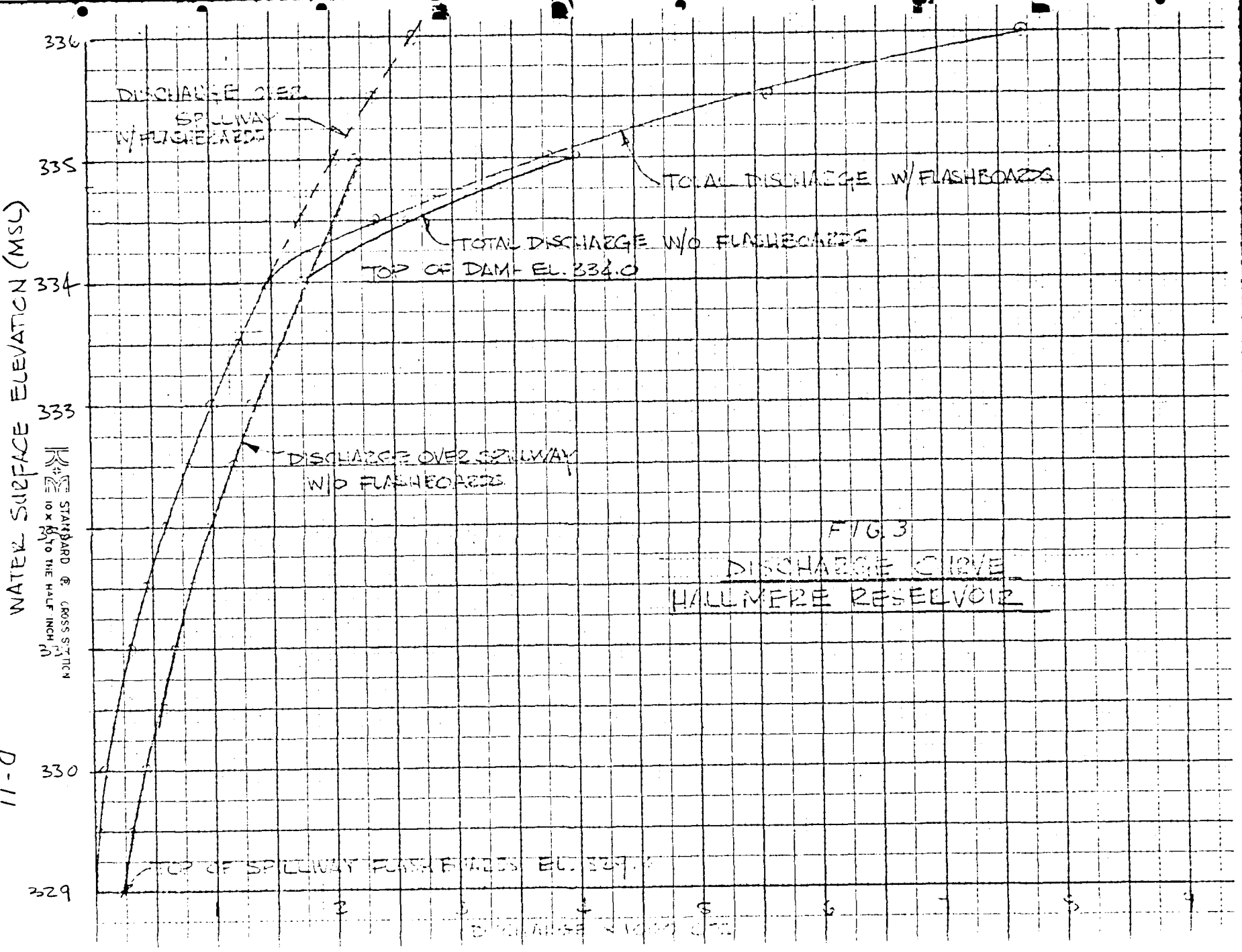


FIG 3

DISCHARGE CURVE

HALLMERE RESERVOIR

11-0

BY JCL DATE 5.14.79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. 1 OF

CHKD. BY DATE DAM INSPECTION PROJECT

SUBJECT HALLMERE RESERVOIR - EFFECT OF SURCHARGE ON MFD

A_D = 650 AC. = 1.02 SQ. MI.
HT. DAM = 45' ±
STORAGE AT NORMAL LEVEL = 440 AC-FT

∴ SIZE CLASSIFICATION = INTERMEDIATE
HAZARD " = HIGH (11 DWELLINGS EFFECTED)
TEST FLOOD EQUALS PMF

ANALYZE PMF

STEP NO. 1 Q_{p_1} = 3200 CFS (COMBINED INFLOW HYDROGRA-

STEP NO. 2 a. SURCHARGE HT. = 334.8 FT

b. VOL. OF SURCHARGE $STOR_1$ IN INCHES

$$= \frac{170 \text{ AC-FT}}{650 \text{ AC}} \times 12 = 3.14 \text{ IN.}$$

$STOR_1$ = 3.14 IN.

c. $Q_{p_2} = Q_{p_1}\left(1 - \frac{STOR_1}{19}\right) = 3200\left(1 - \frac{3.14}{19}\right)$

$= 3200(0.83) = 2671$. CFS

Q_{p_2} = 2671 CFS

STEP 3:

a. SURCHARGE HT. (Q_{p_2}) = 334.6 FT

VOLUME OF SURCHARGE $(STOR_2)$ IN INCHES

$$= \frac{160 \text{ AC-FT} \times 12}{650} = 2.95 \text{ IN}$$

$STOR_2$ = 2.95 INCHES

D-12

STEP 3b: $STOR_1 = 3.14$ IN
$STOR_2 = 2.95$ IN

AV. STOR $= \frac{6.09}{2} = 3.05$ INCHES

$\frac{3.05 \times 650}{12} = 165$ AC-FT

AVE. STOR EL. FOR 165 AC-FT = 334.7 FT

$Q_{p3} = 2900$ CFS

∴ SPILLWAY INADEQUATE TO HANDLE FULL PMF OVER TOP DAM BY 0.7 FT

TRY ½ PMF $Q_{p1} = \frac{3200 \text{ CFS}}{2} = 1600$ CFS

STEP 2a: SURCHARGE HT. = 334.15
2b: " VOLUME = 145 AC-FT.

$STOR_1 = \frac{145 \times 12}{650} = 2.68$ IN

2c: $Q_{p2} = Q_{p1}\left(1 - \frac{STOR1}{9.5}\right) = 1600\left(1 - \frac{2.68}{9.5}\right)$

$= 1600(.718) = 1149$ CFS

3a: SURCHARGE HT. = 333.35 FT
" VOLUME = 120 AC-FT

$STOR_2 = \frac{120 \times 12}{650} = 2.21$ IN

$STOR_1$ = 2.68 AC-FT
$STOR_2$ = 2.21 AC-FT
4.89 AC-FT

$STOR_{AV.}$ = 2.45 AC-FT

$\frac{2.45 \times 650 \text{ Ac}}{12}$ = 132.7 AC-FT

EL. FOR 132.7 AC-FT = 333.6 FT

Qp_3 = 1275 CFS

∴ SPILLWAY ADEQUATE TO HANDLE ½ PMF

BY RCH DATE 5.14.79 **LOUIS BERGER & ASSOCIATES INC.** SHEET NO. 1 OF

CHKD. BY DATE INSPECTION OF DAMS PROJECT

SUBJECT HALLMERE RESERVOIR - FAILURE ANALYSIS

STEP 1: RESERVOIR STORAGE AT FAILURE
ASSUME WATER ELEV. AT TOP OF DAM - 334.0

FROM CAPACITY CURVE - STORAGE AT ELEV. 334.0 = 585 AC-FT

STEP 2: PEAK FAILURE OUTFLOW

$$Q_{p_1} = 8/27\ W_b \sqrt{g}\ Y_o^{3/2}$$

W_b = BREACH WIDTH = 40% ± DAM WIDTH AT MID-HEIGHT

$= 0.4 \times (242') = 96.8'$ USE 100 FT

Y_o = TOTAL HT FROM RIVER BED TO POOL LEVEL AT FAILURE (TOP DAM) = 45' ±

$$\therefore Q_{p_1} = 8/27(100)\sqrt{32.2}\,(45)^{1.5}$$

$$= 168.13\,(301.87) = 50{,}754.3 \text{ CFS}$$

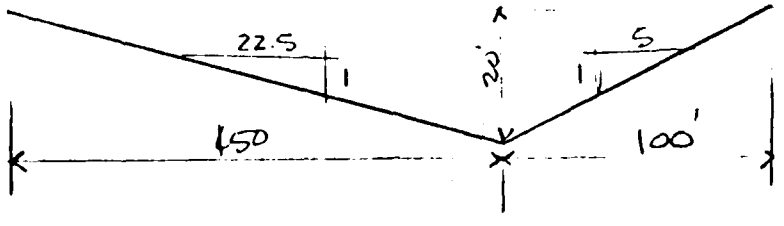
$$\boxed{Q_{p_1} = 50{,}750 \text{ CFS}}$$

STEP 3: STAGE DISCHARGE CURVE FOR D/S

TYPICAL SECTION @ 2000' D/S

$S_{AV} = \frac{20}{1800} = .011$

$S^{1/2} = 0.105$



USING MANNING FORMULA - CALC. PTS FOR STAGE - DISCHARGE CURVE
$n = 0.14$ HDS #3, PG. 10-

$$Q = VA = A\left(\frac{1.486}{n} R^{2/3} S^{1/2}\right)$$

H (FT)	AREA (SF)	P (FT)	$R^{2/3}$	$S^{1/2}$	$1.486/n$	Q (CFS)
5	344	138	1.84	0.105	10.61	705
10	1375	276	2.92	"	"	4,473
15	3094	414	3.82	"	"	13,167
20	5500	552	4.63	"	"	28,393
25	8594	691	5.37	"		51,413.

$S = 585$ $S/2 = 292.5$

STEP 1: ESTIMATE Q_{P2} - REACH OUTFLOW

4A: FOR $Q_{P_1} = 50{,}750$ CFS $\quad STAGE_1 = 24.9$ FT

TRY REACH$_1$ = 2000':

$$A_1 = \frac{24.9 \times 22.5 \times 24.9}{2} + \frac{24.9 \times 5 \times 24.9}{2} = 6975 + 1550$$

$$= 8525 \text{ SF}$$

$$V_1 = \frac{8525 \times 2000'}{43{,}560} = 391 \text{ AC-FT} > S/2$$

TRY L REACH$_1$ = 1500'

$$V_1 = \frac{8525 \times 1500}{43560} = 293 \text{ AC-FT} \quad \text{OK.}$$

4B: Q_{P_2} (TRIAL) $= Q_{P_1}\left(1 - \frac{V_1}{S}\right) = 50{,}750\left(1 - \frac{293}{585}\right) = 25{,}330$ cfs

4C: $STAGE_2$ (TRIAL) = 19.2 FT $\quad A_2 = \frac{19.2 \times 22.5 \times 19.2}{2} + \frac{19.2 \times 5 \times 19.2}{2}$

$= 4147 + 922 = 5069$

$\frac{1}{2} = \frac{5069 \times 1500'}{43560} = 175$ AC-FT

D-16

$V_{AV} = \frac{V_1 + V_2}{2} = \frac{293 + 175}{2} = 234$ AC-FT.

$Q_{p_2} = Q_{p_1}\left(1 - \frac{V_{AV}}{S}\right) = 50{,}750\left(1 - \frac{234}{585}\right) = 30{,}450$ CFS

$STAGE_2 = 20.6'$

∴ AT 1500' D/S $Q_{p_2} = 30{,}450$ CFS
$STAGE_2 = 20.6$ FT

$L_{REACH_2} = 500'$ (2000' D/S)

$A_2 = \frac{20.6 \times 22.5 \times 20.6}{2} + \frac{20.6 \times 5 \times 20.6}{2} = 4774 + 1061$

$= 5835$ SF $V_2 = \frac{5835 \times 500'}{43{,}560} = 70$ AC-FT $< \frac{S}{2}$ ok ✓

4B: $Q_{p_3}(TRIAL) = Q_{p_2}\left(1 - \frac{V_2}{S}\right) = 30{,}450\left(1 - \frac{70}{585}\right) = 26{,}806$ CFS

4C: $STAGE_3(TRIAL) = 19.6$ FT.

$A_3 = \frac{19.6 \times 22.5 \times 19.6}{2} + \frac{19.6 \times 5 \times 19.6}{2} = 4322 + 960 = 5282$ SF

$V_3 = \frac{5282 \times 500}{43560} = 61$ AC-FT

$V_{AV} = \frac{V_2 + V_3}{2} = \frac{70 + 61}{2} = 65.5$ AC-FT

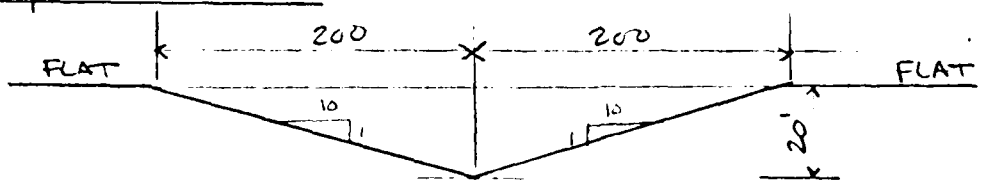
$Q_{p_3} = Q_{p_2}\left(1 - \frac{V_{AV}}{S}\right) = 30{,}450\left(1 - \frac{65.5}{585}\right) = 27{,}040$ CFS

$STAGE_3 = 19.7$ FT

∴ A 2000' D/S $Q_{p_3} = 27{,}040$ CFS
$STAGE_3 = 19.7$ FT.

TRY L_{REACH_3} = 2000 FT. (4000' D/S)

TYPICAL SECTION



USING MANNING FORMULA - $Q = VA = A\left(\frac{1.486}{n} R^{2/3} S^{1/2}\right)$

$S_{AV} = \frac{20}{2000} = 0.01 \quad S^{1/2} = 0.10$

HT (FT)	AREA	P	$R^{2/3}$	$S^{1/2}$	$1.486/n$	Q (CFS)
5	250	100.5	1.84	0.10	10.61	488
10	1000	201.0	2.91	"	"	3088
15	2250	301.5	3.82	"	"	9119
20	4000	402.0	4.63	"	"	19,650

FOR Q_{P_3} = 27,040 CFS $\quad STAGE_2$ = 22.4 FT
L_{REACH_3} = 2000'

$A_3 = 22.4 \times 10 \times 22.4 = 5018$ SF

$V_3 = \frac{2000' \times 5018}{43,560} = 230$ AC-FT $< \frac{S}{2} = 293$ OK

Q_{P_4} (TRIAL) $= Q_{P_3}\left(1 - \frac{V_1}{S}\right) = 27,040\left(1 - \frac{230}{585}\right)$

$= 16,409$ CFS

$STAGE_4$ (TRIAL) = 18.9 FT

$A_4 = 18.9 \times 18.9 \times 10 = 3572$ SF

$V_4 = \frac{3572 \times 2000'}{43,560} = 164$ AC-FT $\quad$ D-18

$V_3 = 230$ AC-FT
$V_4 = 164$ AC-FT

$V_{AV} = \frac{230 + 164}{2} = 197$ AC-FT

$Q_{P4} = Q_{P3}\left(1 - \frac{V_{AV}}{S}\right) = 27040\left(1 - \frac{197}{585}\right)$

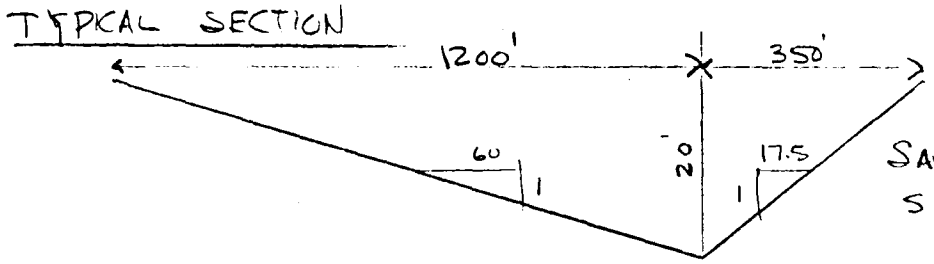
$= 17,934$ CFS

$STAGE_4 = 19.4$ FT

∴ at 4000 D/S $Q_{P4} = 17,934$ CFS
$STAGE_4 = 19.4$

$L_{REACH_4} = 1000'$ (5000' D/S AT ENT. TO KENMERE RES.)

TYPICAL SECTION



$S_{AV} = \frac{10}{875} = 0.114$
$S^{1/2} = 0.107$

HT	A	P	$R^{2/3}$	$S^{1/2}$	$1.49 R^{2/3}/n$	Q cfs
5	969	389	1.84	0.107	10.61	2024
10	3875	775	2.92	"	"	12,846
15	8719	1163	3.83	"	"	37,911
20	15,580	1551	4.64	"	"	81,649

$L_{REACH_4} = 1000'$ FOR $Q_{P4} = 17,934$ CFS, $STAGE_4 = 11.4'$

$A_4 = \frac{60 \times 11.4 \times 11.4}{2} + \frac{11.4 \times 17.5 \times 11.4}{2} = 3899 + 1137$

$= 5036$ SF

$V_4 = \frac{5036 \times 1000}{43560} = 116$ AC-FT

$V_4 = 116$ AC-FT

$Q_{PS(TRIAL)} = Q_{P4}\left(1 - \frac{V_4}{S}\right) = 17{,}934\left(1 - \frac{116}{585}\right) = 14{,}378$ CFS

$STAGE_S(TRIAL) = 10.5$ FT

$A_S = \frac{10.5 \times 60 \times 10.5}{2} + \frac{10.5 \times 17.5 \times 10.5}{2} = 3307 + 965$

$= 4272$ SF

$V_S = \frac{4272 \times 1000}{43{,}560} = 98$ AC-FT

$V_{AV} = \frac{V_4 + V_S}{2} = \frac{116 + 98}{2} = 107$ AC-FT

$Q_{PS} = Q_{P4}\left(1 - \frac{V_{AV}}{S}\right) = 17{,}934\left(1 - \frac{107}{585}\right) = 14{,}654$ CFS

$STAGE_S = 10.6$ FT

@ AT 5000' D/S) $Q_{PS} = 14{,}650$ CFS $STAGE_S = 10.6$ FT

FIG. 4

STAGE - DISCHARGE CURVE

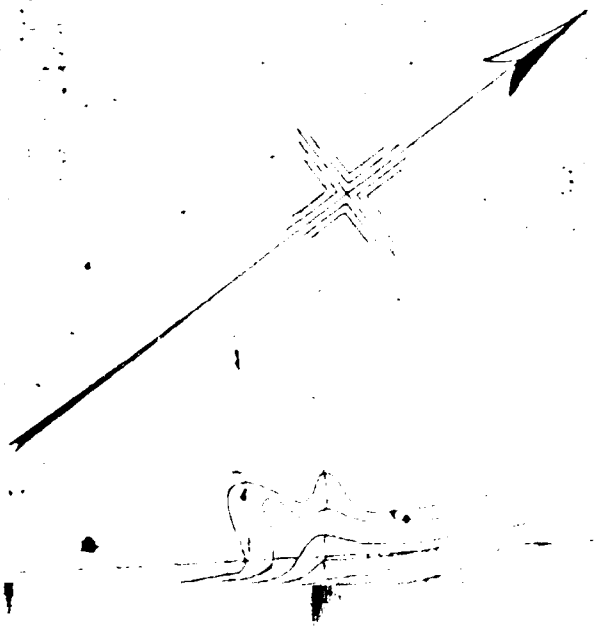
HALLMERE RESERVOIR

(1)

MERIDEN WATER WORKS

Map of

HALL MERI



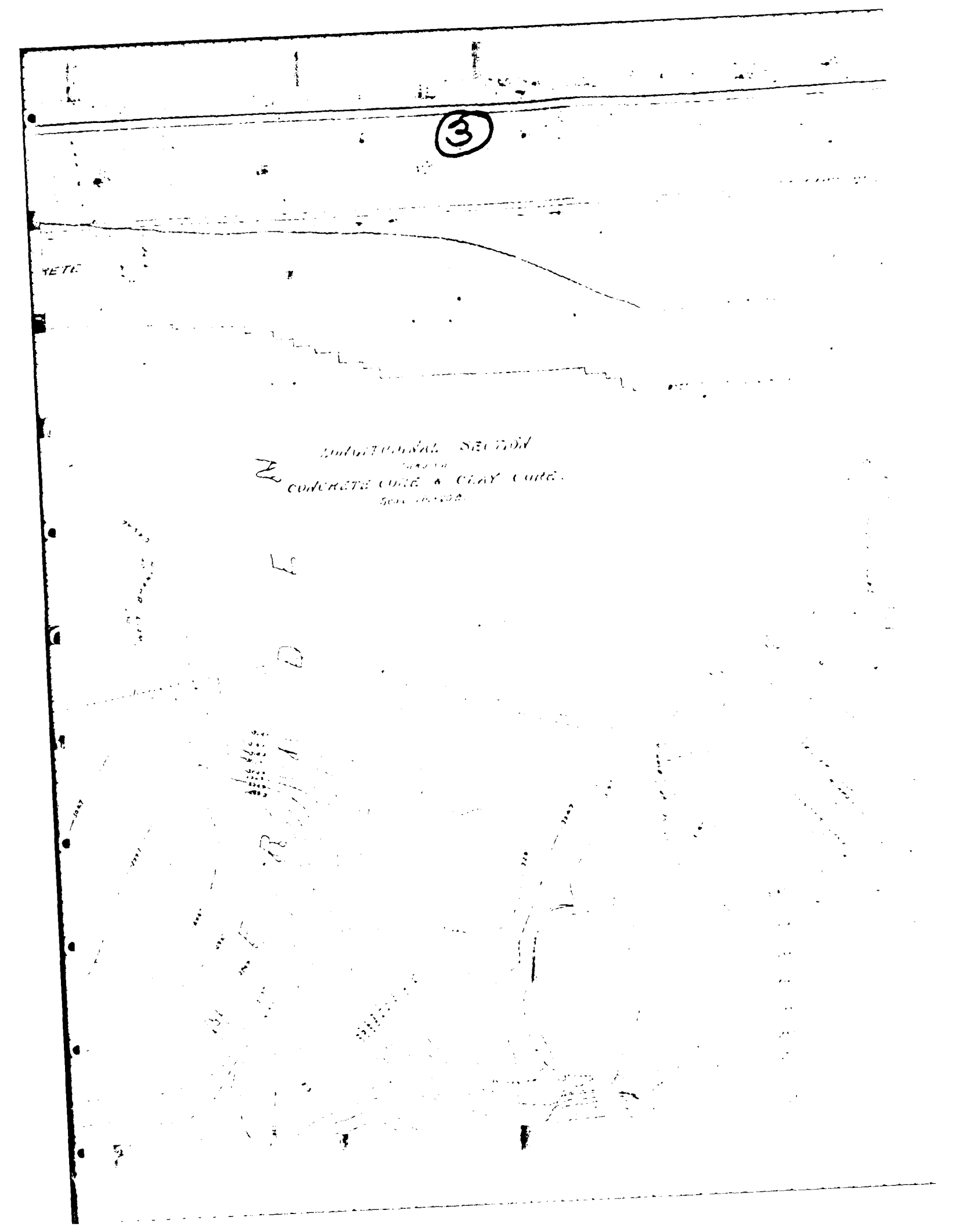
(2)

WATER WORKS

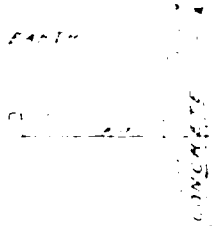
Map of

LMERE.

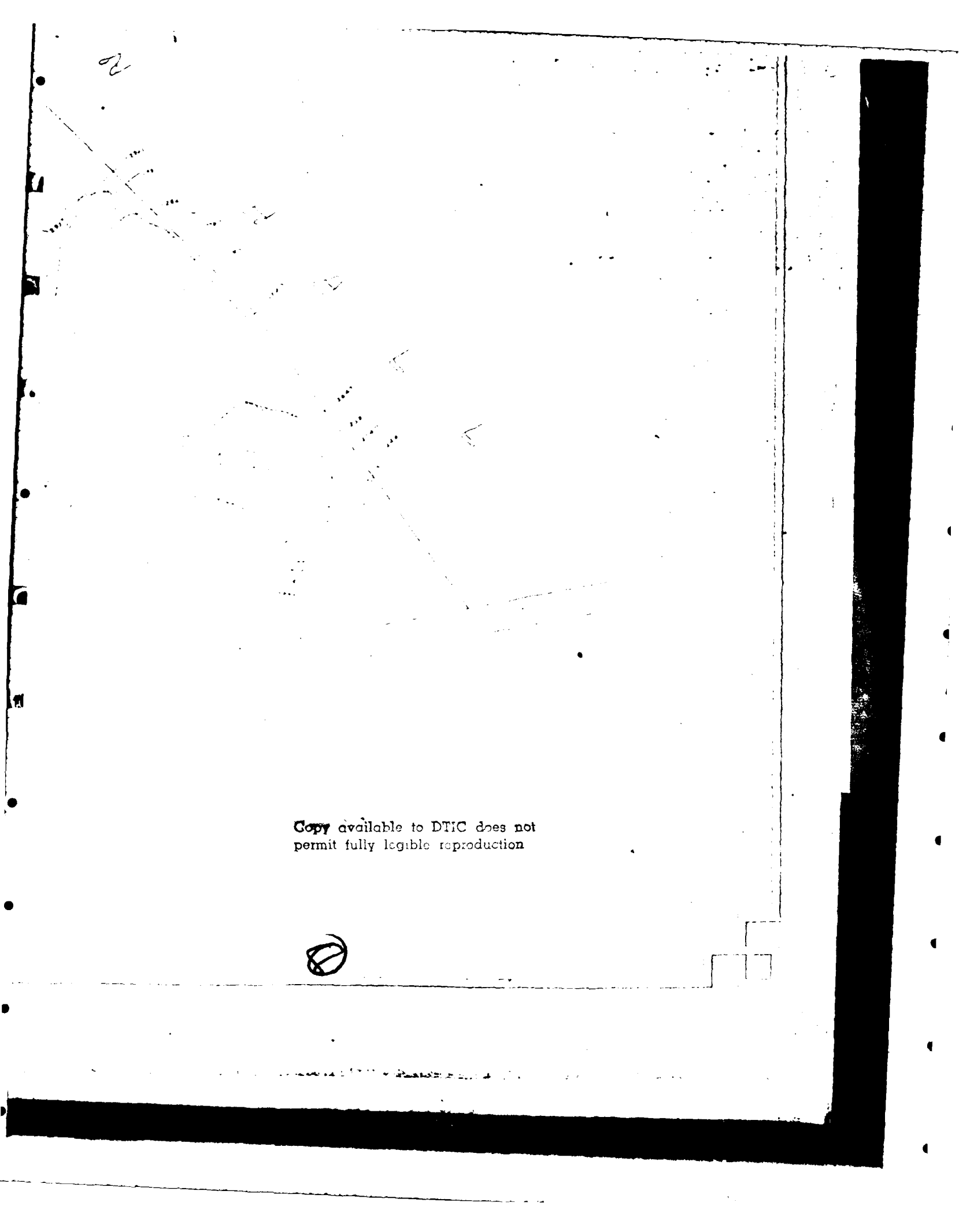
(3)

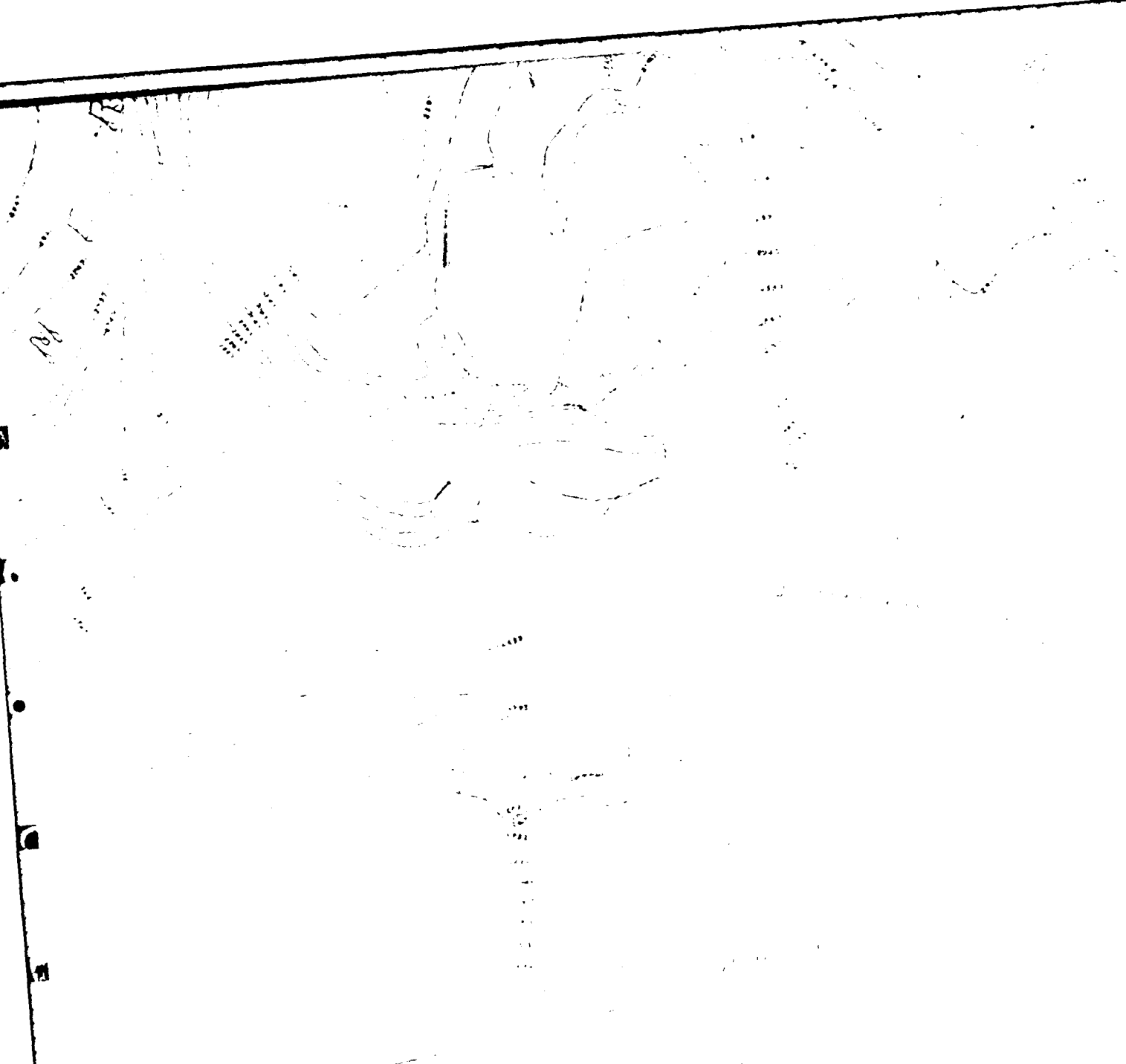


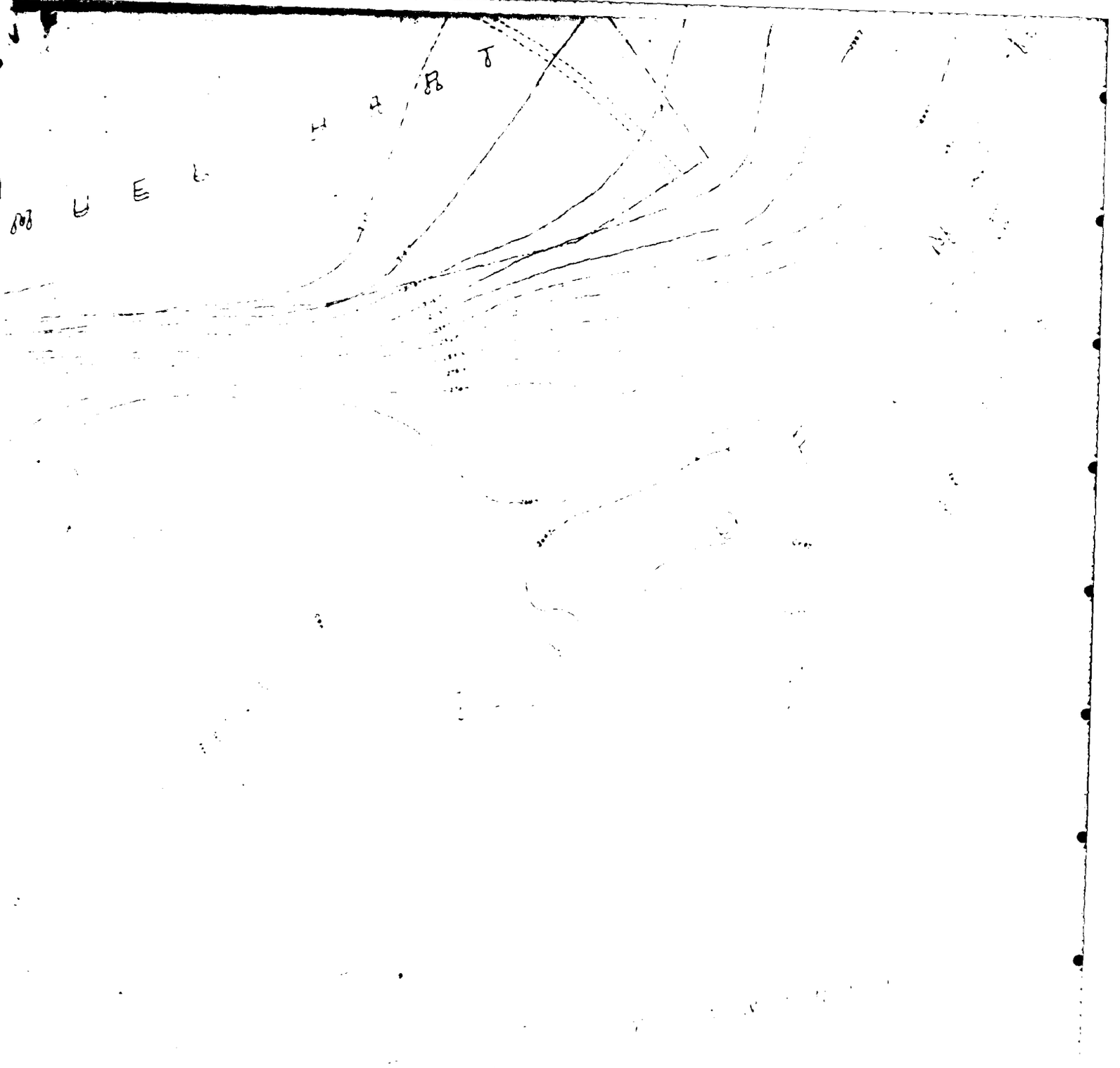
(4)

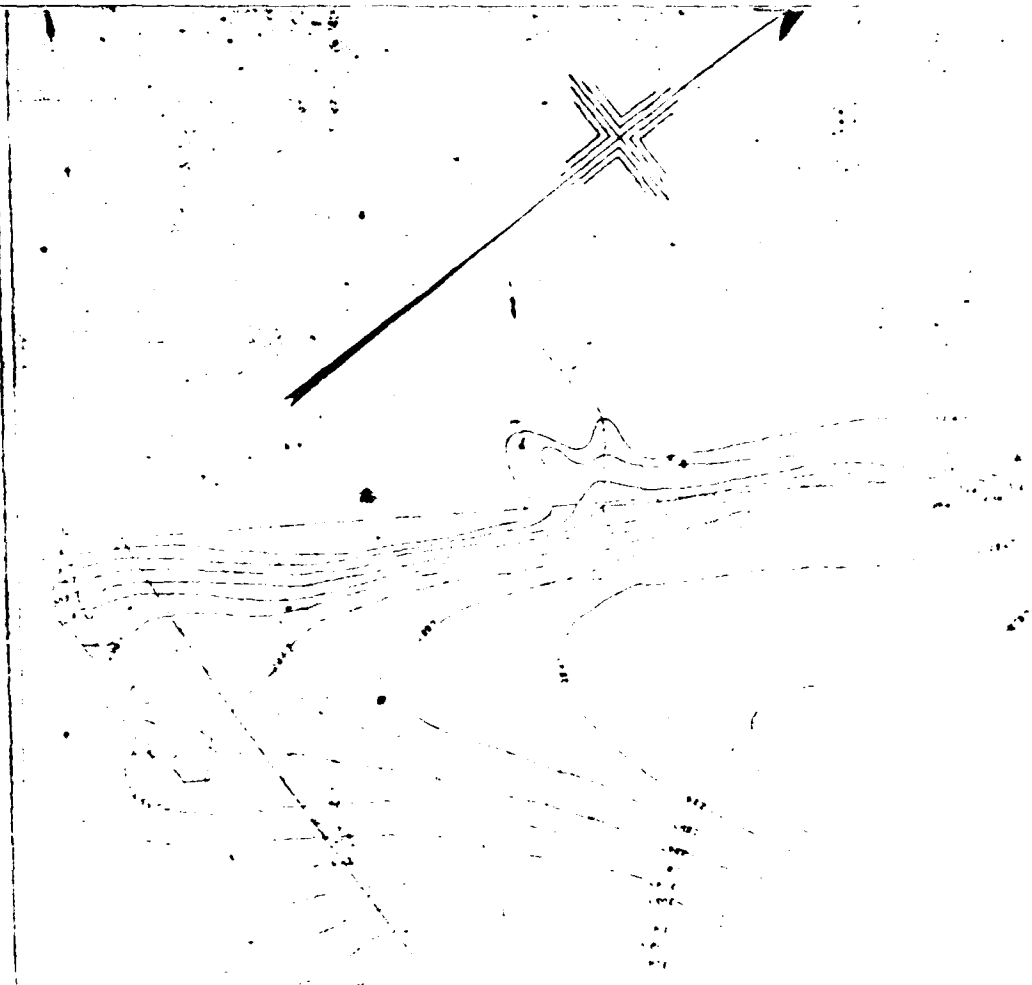


SECTION
OF
DAM, GATE HOUSE, ETC.
Scale, 1 in. = 2 ft









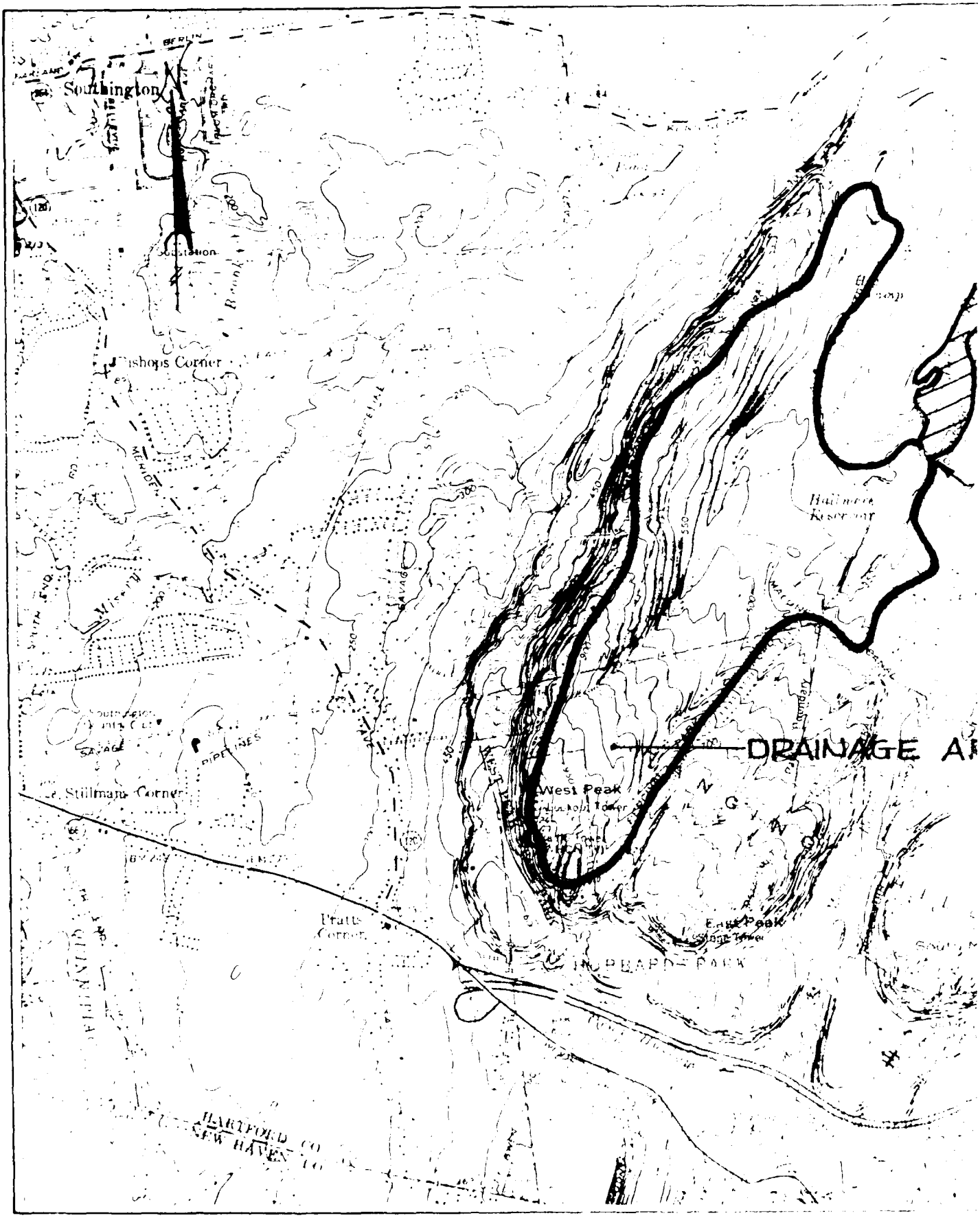
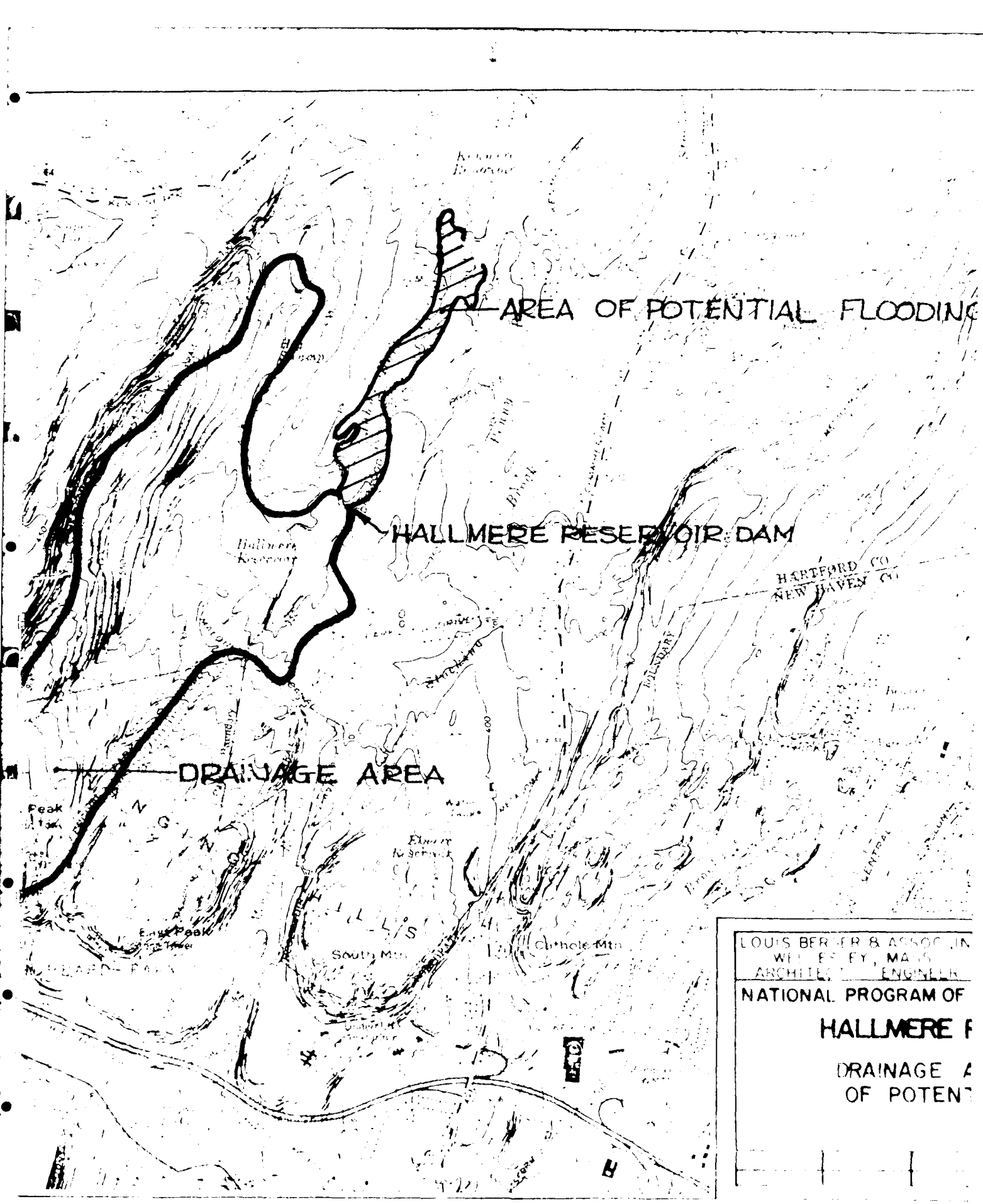
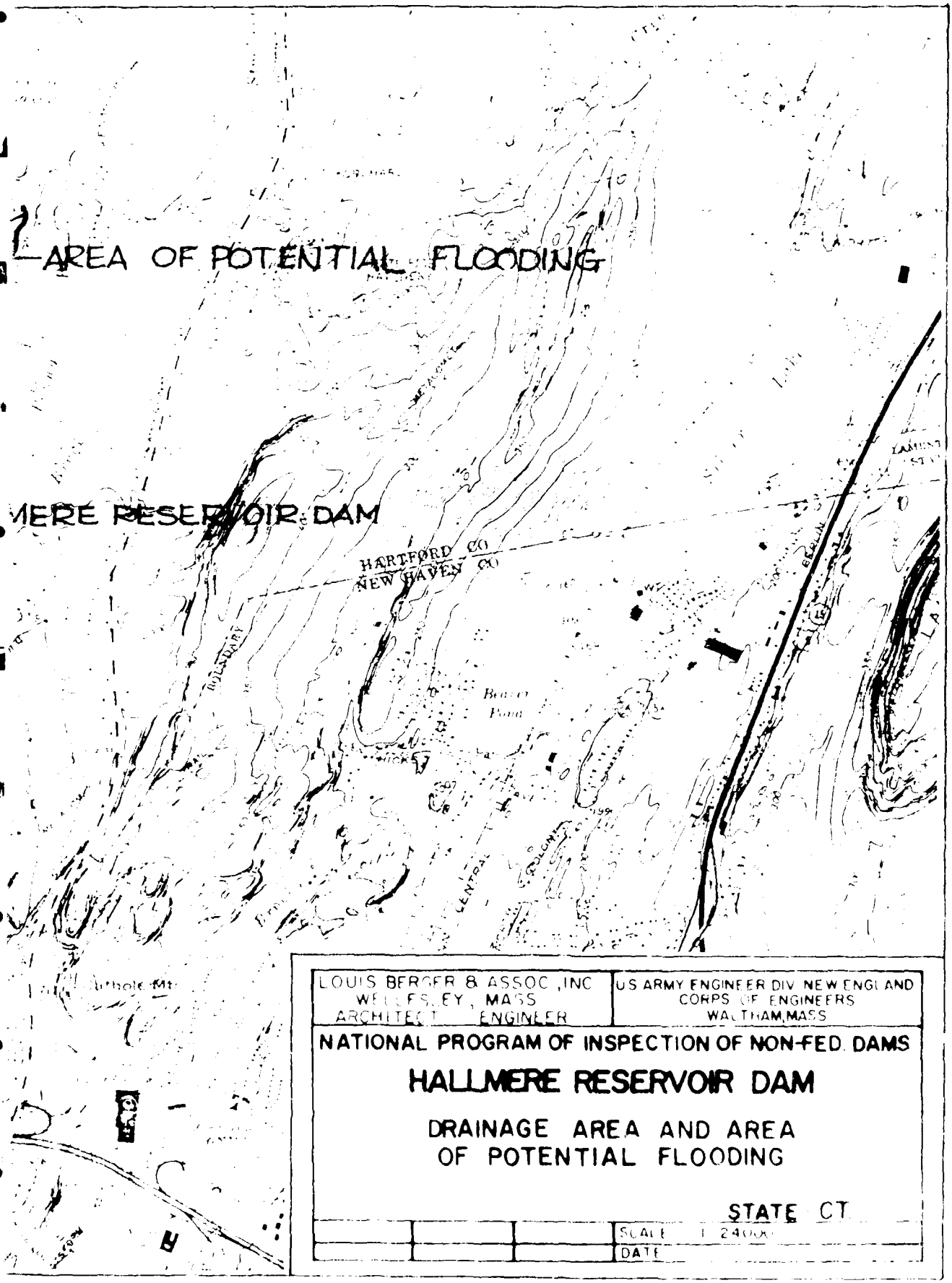

Southington
Bishops Corner
Stillman Corner
West Peak
DRAINAGE A

FIG 5


AREA OF POTENTIAL FLOODING
HALLMERE RESERVOIR DAM
DRAINAGE AREA
HARTFORD CO
NEW HAVEN CO
LOUIS BERGER & ASSOCIATES
WELLESLEY, MASS.
ARCHITECTS ENGINEERS
NATIONAL PROGRAM OF
HALLMERE R
DRAINAGE A
OF POTENT



LOUIS BERGER & ASSOC., INC WELLESLEY, MASS ARCHITECT ENGINEER	US ARMY ENGINEER DIV. NEW ENGLAND CORPS OF ENGINEERS WALTHAM, MASS

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

HALLMERE RESERVOIR DAM

DRAINAGE AREA AND AREA OF POTENTIAL FLOODING

STATE CT

			SCALE 1:24000
			DATE

FIG. 5

APPENDIX E

INFORMATION AS CONTAINED IN THE NATIONAL INVENTORY OF DAMS

INVENTORY OF DAMS IN THE UNITED STATES

STATE	COUNTY	NAT'L CONGR DIST	STATE	COUNTY	CONGR DIST	NAME	LATITUDE (NORTH)	LONGITUDE (WEST)	REPORT DATE DAY	MO	YR
CT	[illegible]		CT	[illegible]		HALLMERE RESERVOIR DAM	4130.6	7249.0	25	JUN	79

POPULAR NAME	NAME OF IMPOUNDMENT
	HALLMERE RESERVOIR

RIVER OR STREAM	NEAREST DOWNSTREAM CITY-TOWN-VILLAGE	DIST FROM DAM (MI)	POPULATION
[illegible] HALL BROOK	KENSINGTON	4	6000

TYPE OF DAM	YEAR COMPLETED	PURPOSES	STRUCTURAL HEIGHT (FT)	HYDRAULIC HEIGHT (FT)	IMPOUNDING CAPACITIES MAXIMUM (ACRE-FT)	IMPOUNDING CAPACITIES NORMAL (ACRE-FT)	DIST	DAM	FED R	PRV/FED	SCS A	VER/DATE
[illegible]	1907	S	75	69	545	460	NED	N	N	N	N	25JUN79

REMARKS

[illegible] ESTIMATE

LENGTH (FT)	TOP WIDTH (FT)	MAX DISCHARGE (CFS)	VOLUME OF DAM (CY)	POWER CAPACITY INSTALLED (MW)	POWER CAPACITY PLANNED (MW)	NAVIGATION LOCKS NO	LENGTH (FT)	WIDTH (FT)	AUXILIARY LOCKS NO	LENGTH (FT)	WIDTH (FT)
[illegible]	[illegible]	1473	43000								

OWNER	ENGINEERING BY	CONSTRUCTION BY
CITY OF [illegible] TOWN		

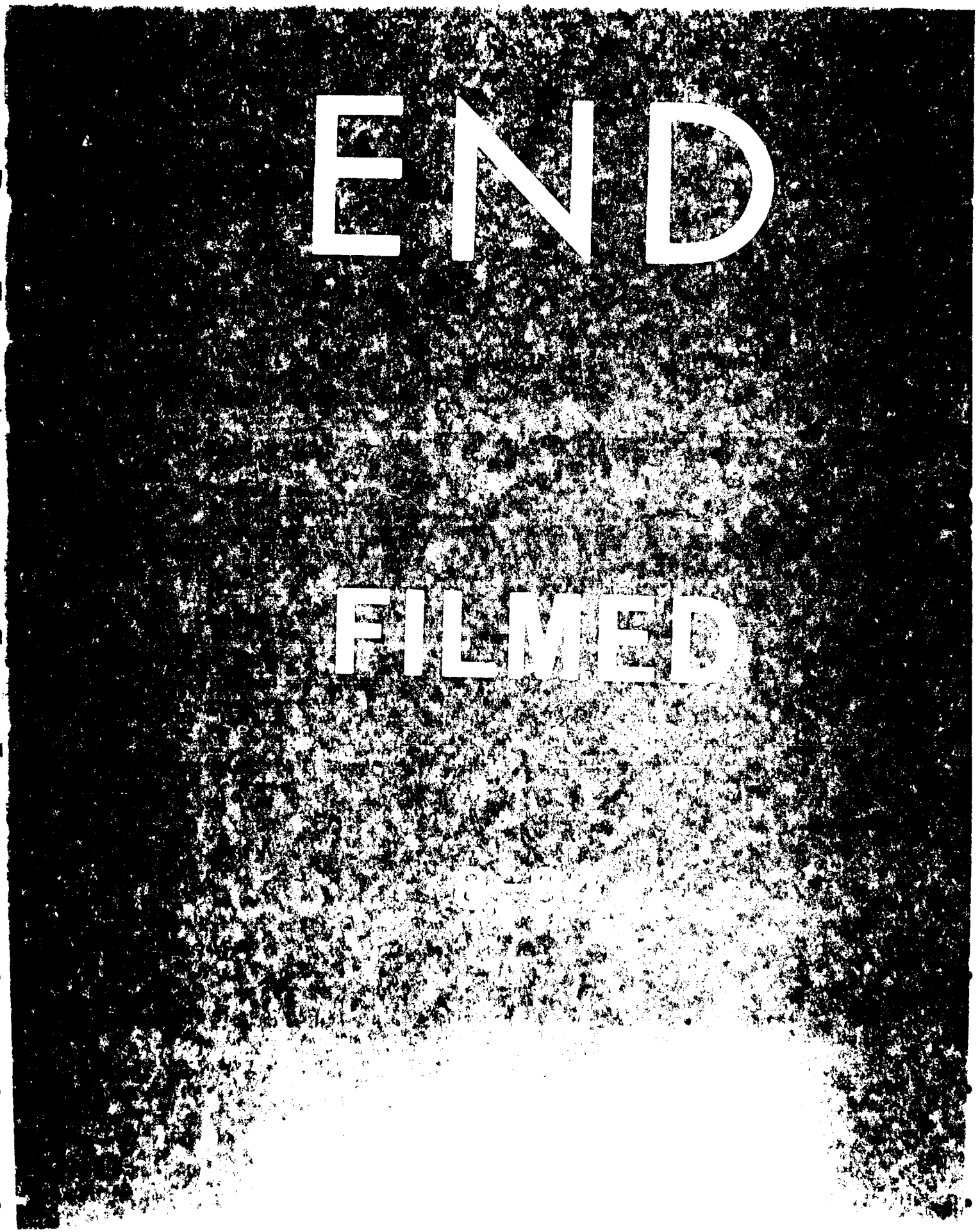
REGULATORY AGENCY

DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
NONE	NONE	NONE	CT DEP

INSPECTION BY	INSPECTION DATE DAY	MO	YR	AUTHORITY FOR INSPECTION
LOUIS BERGER & ASSOCIATES, INC	24	APR	79	PL92-367

REMARKS

SI-FLASHBOARDS SS-WITH FLASHBOARDS


END
FILMED